

Thesis

Posttraumatic stress and growth symptoms in parents of premature infants: The role of  
rumination type and social support

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## Abstract

Research has started to recognise premature birth and subsequent hospitalisation of the infant as a potentially traumatic experience for parents. There is also a growing interest within the trauma literature, of the potentially positive psychological changes that can occur following a traumatic experience, termed posttraumatic growth (PTG).

The purpose of this cross-sectional, correlational study was to report rates of posttraumatic stress symptoms (PTSS) and PTG in parents of premature babies, 4-8 weeks after discharge from the Neonatal Unit (NNU) or Neonatal Intensive Care Unit (NICU). The study also aimed to explore the role of intrusive and deliberate rumination and social support in the development of PTG as described by the Tedeschi and Calhoun (2004) model of PTG.

Thirty mother-father pairs and an additional twenty-three mothers were recruited from 2 NNUs and 2 NICUs in East Anglia, during 2 recruitment periods lasting 7 months and 3 months respectively. These parents completed 6 self-report questionnaires, 4-8 weeks post discharge from hospital. Parents completed validated measures of PTSS (IES-R), PTG (PTGI), intrusive and deliberate rumination (ERRI), social support (CSS) and depression (CES-D).

Deliberate rumination was found to be a significant predictor of PTG development, more so than PTSS, intrusive rumination and social support. PTSS and PTG were positively correlated for mothers only ( $r = .381, p < .01$ ). Of the whole sample, 10/53 (19%) of mothers and 1/30 (3%) of fathers met the screening criteria for PTSD. Twelve of 53 (23%) of mothers and 5/30 (17%) of fathers reported moderate levels of PTG. Mothers reported significantly higher levels of PTSS ( $p = .023$ ), PTG ( $p = .018$ ), deliberate rumination ( $p = .007$ ) and intrusive rumination ( $p = .000$ ) than fathers.

This study demonstrated the existence of both PTSS and PTG in mothers and fathers of premature infants who have been hospitalised on a NICU. These data suggest that further study is indicated of the impact of PTG on future parental well-being following the stress associated with premature birth and hospitalisation. Deliberate rumination has been found to be a potentially significant factor in the development of PTG, therefore, future studies are needed to test this aspect of the PTG (Tedeschi & Calhoun, 2004) model further.

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# **1. Introduction**

## **1.1 Chapter Overview**

This thesis aims to investigate the levels of, and relationship between, posttraumatic stress symptoms (PTSS) and posttraumatic growth (PTG) in parents of premature babies. The thesis also explores the role of rumination, social support, and gender of parent. To this end, this Introduction chapter aims to highlight the potential for these parents to experience both trauma and growth symptoms. Both parents are included because there is currently limited research examining mental health consequences in fathers and the overall experience for couples. The chapter also considers in more detail the relationship between PTG and PTSS, making links to the model of PTG developed by Tedeschi and Calhoun (2004). Rumination type and social support are suggested to be important factors in the development of PTG based on this model although little is known of their role within this population.

This chapter begins with a summary of the prevalence and profile of premature birth before focusing on the impact premature birth and subsequent hospitalisation of the baby can have on the mental health of parents. The potential negative consequences of parental mental health difficulties on the developing infant are highlighted in order to illustrate the importance of recognising mental health difficulties in parents of premature babies.

There are a small but increasing number of studies recognising the experience of having a premature baby hospitalised on a neonatal unit to potentially be traumatic. To expand our understanding of the experience for these parents the concept of posttraumatic growth (PTG) is also explored. PTG refers to positive psychological changes that can

occur as a result of distress and trauma. Predictors of PTG are discussed, reviewing studies from a range of populations, focusing on gender factors, rumination and social support, the latter two factors being central components of the model of PTG (Tedeschi & Calhoun, 2004) and also relevant to models of PTSD. A comprehensive review of the literature exploring the relationship between PTSS and PTG is then undertaken highlighting mixed findings and the need for further research. Throughout the chapter potential differences between the experience and symptoms of mothers and fathers are discussed. This is relevant given the paucity of research including fathers and the need to understand the potential impact of both maternal and paternal mental health on the parent-child relationship and on infant development. This will support a move towards a broader and more systemic understanding of the experience for families within paediatric settings which, it is suggested would be beneficial clinically.

## **1.2 Prevalence and Profile of Premature Births**

Premature birth is defined as childbirth occurring at less than 37 weeks gestation and is associated with a range of neonatal health problems (Beck et al., 2010). Worldwide prevalence of premature birth in 2005 was 9.6% with the highest rates occurring in Africa, Asia and North America (Beck et al., 2010). In countries such as the UK and USA, premature birth rates have risen over the past 20 years. Possible reasons for this include changes in clinical practices (i.e., greater use of Caesarean section and assisted reproductive techniques, women having children later, and increasing rates of multiple births; Beck et al., 2010). Children born prematurely are more likely to have cognitive, developmental, perceptual-motor delays, and behavioural problems which can impact on development throughout childhood and into adulthood (Aylward, Pfeiffer, Wright, & Verhulst, 1989; Breslau, 1995; Jongmans, Mercuri, Dubowitz, & Henderson, 1998; Loe, Lee, Luna, & Feldman, 2011). Premature babies often require hospitalisation on a

Neonatal Intensive Care Unit (NICU) or Neonatal Unit (NNU). These settings may add to their developmental vulnerability through sensory overstimulation, repeated medical procedures, pain and parental separation (Lefkowitz, Baxt, & Evans, 2010).

Furthermore, parent mental health difficulties associated with the distress and experience of having a premature baby hospitalised may further compound negative consequences for the child's development. For example, postpartum depression has been linked to reduced quality in mother-child interactions (Korja et al., 2008), attachment difficulties (Poehlmann & Fiese, 2001) and endocrinal system changes (Bugental, Beaulieu, & Schwartz, 2008), potentially impacting on emotional and behavioural regulation. Similar findings have been reported for postpartum posttraumatic stress symptoms (PTSS), suggesting negative consequences for attachment relationships and infant emotional behavioural regulation (Bosquet Enlow et al., 2011; Forcada-Guex, Borghini, Pierrehumbert, Ansermet, & Muller-Nix, 2011).

### **1.3 Parent Mental Health Following Term Birth**

The existence of mental health problems in women following term childbirth has been well documented particularly in terms of rates of depression. Paulson and Bazemore (2010) reported a peak rate of 41.6% maternal depression in the 3-6 month period after birth. This was positively correlation with paternal depression which ranged between 8.5 and 12.7% between the 1<sup>st</sup> trimester and 1 year postnatal period. This is consistent with data reported by Bradley, Slade, and Leviston (2008) and Leeds and Hargreaves (2008).

Predictors of post-partum depression include prenatal depression and anxiety, previous episodes of depression, low self-esteem, lack of social support, difficulties in marital relationship, difficult infant temperament and an unplanned/unwanted pregnancy (Beck, 2001).

Studies exploring PTSD in parents (predominantly mothers) after childbirth reported rates ranging between 1.2% and 27% (Alcorn, O'Donovan, Patrick, Creedy, & Devilly, 2010; Ayers, Wright, & Wells, 2007; C. T. Beck, Gable, Sakala, & Declercq, 2011; Bosquet Enlow et al., 2011; Leeds & Hargreaves, 2008; Olde, Van Der Hart, Kleber, & Van Son, 2006; Sawyer & Ayers, 2009; Stramrood et al., 2011; Susan, Harris, Sawyer, Parfitt, & Ford, 2009; Zaers, Waschke, & Ehlert, 2008; Zambaldi, Cantilino, & Sougey, 2010). The literature on fathers, however, is limited. Bradley et al. (2008) reported low rates of PTSD in fathers 6 weeks following the birth.

Risk factors for development of PTSD in women following childbirth appear to include predisposing factors such as trait anxiety, history of mental health difficulties, history of sexual abuse, depressive symptoms during pregnancy and an unplanned pregnancy. Perinatal risk factors including high fear for self and/or baby, perceived low levels control, high levels of pain and low social support, instrumental delivery, emergency caesarean and infant health problems (Ayers et al., 2007; Slade, 2006). Focusing on fathers, Bradley and Slade (2011) reported that PTSD in fathers following childbirth may be related to their experience of witnessing the birth particularly if they felt pressured to attend the birth or believe they did not support their partner well.

#### **1.4 Parent Mental Health Following the Birth of a Premature or at Risk Baby**

The presentation of mental health problems increases in parents of premature or at risk infants admitted to a NICU, compared to those of healthy, term babies. For example Treyvaud et al. (2010) found that 12% of parents of babies born at term had clinically significant mental health problems, compared to 26% of parents of babies born prematurely. As suggested in section 1.2, mental health difficulties in a parent can have serious consequences for the child's subsequent development. The potential reasons for



increased mental health difficulties in parents of premature babies are many. They may include; extreme anxiety about their baby's survival and long term health prospects, the often fragile appearance of their baby, the use of complex medical language and the many medical sights and sounds on the unit. Furthermore, parents are separated from their baby, often having to rely on ward staff and therefore they may experience a loss of their role as their baby's primary carer which may lead to feelings of guilt and helplessness (Holditch-Davis, Bartlett, Blickman, & Miles, 2003; Joseph, Mackley, Davis, Spear, & Locke, 2007; Lefkowitz et al., 2010; Miles & Holditch-Davis, 1997). Mental health problems can include depression both at the time of infant hospitalisation (Mew, Holditch-Davis, Belyea, Miles, & Fishel, 2003), and after this, for example when the baby is 6-months (corrected) age (Korja et al., 2008). Depression is often experienced co-morbidly with other mental health difficulties such as anxiety disorders.

The literature indicates that premature birth and hospitalisation can be highly traumatic events for parents; therefore the emotional distress resulting from this experience may be understood as a posttraumatic stress (PTS) response. With increased awareness for staff and parents of potential PTS responses and the impact this can have on the developing infant, there is the chance for earlier identification and treatment (Jotzo & Poets, 2005).

The next section explores this further, starting with a summary of the diagnostic criteria for PTSD and some key models of PTSD, before discussing prevalence, predictors and gender differences in PTSS in parents of premature or hospitalised babies.

## **1.5 Posttraumatic Stress Disorder (PTSD)**

### **1.5.1 Definition of PTSD.**

For a diagnosis of PTSD to be made a number of criteria need to be met as outlined by DSM-IV. These are described in Appendix A. In summary, a diagnosis can be given if an event occurs which is sufficiently threatening enough for a person to experience intense feelings of fear, helplessness or horror. This experience also needs to be persistently re-experienced, as well as stimuli associated with the event persistently avoided by the person. A person may be diagnosed with PTSD if these symptoms are present one month following the event and cause distress or impairment in significant areas of functioning (i.e., occupational).

Given the often life-threatening circumstances that surround the admission of a baby to a NICU and the experience of fear and helplessness that has been described by parents, it is hypothesised that exploring the associated parental distress within a PTSD framework may be useful.

### **1.5.2 Models of PTSD.**

To provide a context for our understanding of PTSD, three models will be briefly summarised; The theory of shattered assumptions (Janoff-Bulman, 1992) the cognitive model of PTSD (Ehlers & Clark, 2000) and the metacognitive model of PTSD (Wells & Sembi, 2004a). These models are the most relevant given the focus on PTSD and PTG, however a more comprehensive review of PTSD models can be found in Brewin and Holmes (2003).

#### ***1.5.2.1 Theory of shattered assumptions.***

Janoff-Bulman (1992) described traumatic stress as stemming from the shattering of basic assumptions that are held about ourselves and the world. Three dominant types of assumptions are discussed which the theory suggests the majority of people share. These are: 1) the belief in personal invulnerability, 2) the perception of the world as meaningful and comprehensible and 3) the view of ourselves in a positive light.

This theory benefits from its explanatory power, referring to the development of assumptions that are consistent with attachment and information-processing theories. While there is some research evidence supporting the existence of these assumptions (Janoff-Bulman & McPherson Frantz, 1997; Weinstein, 1980, 1982) other assumptions may also be important to consider, for example, the world is able to satisfy one's needs (Bolton & Hill, 1996). The theory describes that the shattering of these assumptions by the traumatic event leads to the development of PTSD because the world is no longer comprehensible, meaningful or manageable. The theory also discusses how assumptions can be updated and draws from stress response theory (Horowitz, 1986) to explain this process, through oscillation between avoidance and engagement with the traumatic material. Furthermore, this process may occur more deliberately by purposefully reflecting back on the trauma and searching for meaning. Janoff-Bulman and Frieze (1983) discussed how this results in better adjustment and less psychological distress.

The theory of shattered assumptions may be said to describe some core components that are more comprehensively described and evaluated in the later cognitive model of PTSD (Ehlers & Clark, 2000). In this sense the theory is important in identifying the role of assumptions and the person's context in the experience of trauma. It also is important in its description of adjustment processes following PTSD, again shedding light on potential areas that require further research and specification. It is argued that the theory would benefit from further explanation of how the process of shattering assumptions occurs

resulting in a trauma response, for example discussing how the trauma is represented in memory. Furthermore, the theory predicts that it is those people that hold the most positive assumptions or hold these most strongly that are more likely to experience PTSD (Brewin & Holmes, 2003). This is not consistent with the evidence that links previous trauma as a risk factor for PTSD (Brewin, Andrews, & Valentine, 2000). It may be argued that these assumptions have already been shattered, however the theory does not seem to easily account for the maintained risk of PTSD. Furthermore, other components of the PTSD experience such as dissociation are not explored comprehensively in comparison to later models of PTSD such as the cognitive model (Ehlers & Clark, 2000).

#### **1.5.2.2 Cognitive model.**

The cognitive model of PTSD (Ehlers & Clark, 2000) suggests that individuals experience persistent PTSD if they process the traumatic event in a way that produces a current sense of threat. This occurs through, 1) individual differences in the appraisal of the traumatic event and/or its sequelae and 2) individual differences in the nature of the trauma memory and its level of integration with other autobiographical memories. The model outlines a range of different appraisals either relating to external (e.g. the world is a more dangerous place) or internal (e.g. I am unable to cope) threats. These different appraisals lead to the experience of a range of different emotions e.g. appraisals of danger leading to fear and appraisals of loss leading to sadness. The second aspect leading to the current sense of threat is the lack of integration of the trauma memories into other existing autobiographical memories. This explains the difficulty individuals with PTSD often have in narrating the traumatic events. Furthermore, the persistent and intrusive nature of many PTSD experiences is explained by the strong stimulus-stimulus and stimulus-response associations that develop. This is partly explained by differences in encoding at the time of the trauma and the model differentiates between data-driven processing (primarily sensory

based) and conceptual processing (focused on the meaning, context and organisation of information). At the time of the trauma, conceptual processing facilitates integration of trauma memories, whereas data-driven processing results in strong perceptual priming, meaning that there is a reduced threshold for trauma related stimuli (Brewin & Holmes, 2003).

The cognitive model of PTSD also proposes that other peritraumatic factors may lead to the poor integration of the trauma memories, namely dissociation, emotional numbing and an inability to establish a self-referential perspective. In addition, the cognitive model of PTSD discusses in detail how PTSD is maintained by maladaptive cognitive processing (selective attention to threat cues, rumination) and behavioural strategies (avoidance of trauma reminders, adoption of safety behaviours).

The cognitive model has extended emotional processing theory (Foa & Riggs, 1993) by suggesting that there is more than one type of memory system. There is, however, much overlap between the systems described in the cognitive model and the 'verbally accessible system' (VAM) and 'situationally accessible system' (SAM) described by Brewin, Dalgleish, and Joseph (1996) in the dual representation theory. What appears to differentiate them is a bigger emphasis on how information is processed during trauma by Ehlers and Clark (2000) as opposed to how the output of this processing is stored in memory. Despite this emphasis, difficulties in experimentally controlling data-driven and conceptual processing has resulted in less evidence for these aspects of the model (Brewin & Holmes, 2003). A benefit of the cognitive model is that it discusses the maintenance of PTSD in the form of maladaptive cognitive processing such as rumination, and behavioural strategies such as avoidance, and provides evidence for these processes (Dunmore, Clark, & Ehlers, 1999, 2001; Murray, Ehlers, & Mayou, 2002). The model underpins one of the leading treatment options for PTSD, cognitive behavioural therapy which has a growing

evidence base (Ehlers, Clark, Hackmann, McManus, & Fennell, 2005; Harvey, Bryant, & Tarrier, 2003; Zayfert & Becker, 2007).

### **1.5.2.3 *Metacognitive model.***

As with the cognitive model of PTSD (Ehlers & Clark, 2000), the metacognitive model of PTSD (Wells & Sembi, 2004a, 2004b) assumes that PTSD is experienced because of a disruption to adaptive emotional processing of the experience. In the metacognitive model, the Reflexive Adaptation Process (RAP) describes the automatic emotional processing and development of plans which guide cognitive and behavioural activities, initiated by threats such as intrusive thoughts. Responses to threat such as intrusions and hyperarousal are viewed as normal automatic responses in the model. The adaptation process may be blocked, however, by unhelpful styles of thinking and coping. The style of thinking and coping a person uses is influenced by internal beliefs and environmental factors. In relation to internal beliefs, the metacognitive model of PTSD (Wells & Sembi, 2004a, 2004b) differs to the cognitive model (Ehlers & Clark, 2000), as it centralises the role of metacognitions (i.e., beliefs and strategies used to regulate thinking itself) in guiding cognitions, and in the choice of coping strategies. Metacognitions are proposed to influence the existence and use of processes that potentially block adaptive emotional processing of events, often coming in the form of worry/rumination, threat monitoring and thought-control strategies. These processes are suggested to be unhelpful because they block automatic adaptive emotional processing and maintain and reinforce perceptions of threat.

The model emphasises the need for the flexible use of coping strategies in response to threat, such as that of running mental simulations of dealing with the trauma. However, the model describes that in PTSD, the resources required for running adaptive mental

simulations are taken up by unhelpful coping responses, the use of which are guided by metacognitions (e.g., repeated verbally based analysis of the event competes with the adaptive imagery processing would normally automatically take place). As with the cognitive model (Ehlers & Clark, 2000), negative interpretations of symptoms such as intrusive thoughts and hyperarousal maintain the perception of on-going threat (Wells & Sembi, 2004a, 2004b).

In essence, the use of adaptive strategies in response to threat (such as low levels of rumination, flexible attention control, mental simulation and acceptance of symptoms), allow reflexive processing to occur so plans for future coping spontaneously develop. Blocks to this process through the use of strategies such as rumination, threat monitoring, dissociation, negative appraisal of symptoms and thought-control mean that the person is unable to exit the RAP and are effectively stuck, attempting to cope with non-existent threat in the present (Wells & Sembi, 2004a, 2004b). An individual's metacognitions and triggers in the environment, guide the use of adaptive or maladaptive processing.

The model suggests, therefore, that interventions should focus on removing the barriers to adaptive processing, as opposed to focusing on changing the way in which trauma memories are laid down through cognitive restructuring and imaginal re-living (Wells & Sembi, 2004a). Studies have positively correlated rumination with intrusions and PTSD symptoms (G. Butler, Wells, & Dewick, 1995; Holeva, Tarrier, & Wells, 2002; Wells & Papageorgiou, 1995), which Wells and Sembi (2004a, 2004b) took as evidence for the model. It may be argued, however, that such findings could be taken as support for a range of models of PTSD (e.g., the cognitive model; Ehlers & Clark, 2000). Furthermore, there is evidence supportive of imaginal re-living as a treatment for PTSD. Wells and Sembi (2004a, 2004b) however argue that the success of such treatments can be explained by the metacognitive model as such interventions allow the running of mental

simulations of the experience which facilitates the natural running of the RAP and plan formation. It seems that the metacognitive model of PTSD focuses predominantly on post-event responses as opposed to the cognitive model which considers both peri-traumatic processing and post-event responses.

#### **1.5.2.4. *Summary of PTSD models.***

In summary, the theory of shattered assumptions (Janoff-Bulman, 1992) and the cognitive (Ehlers & Clark, 2000) and metacognitive model (Wells & Sembi, 2004a, 2004b) of PTSD overlap in terms of their focus on cognition (i.e., beliefs and assumptions). The cognitive model (Ehlers & Clark, 2000) expands on the more general ideas put forward by the theory of shattered assumptions (Janoff-Bulman, 1992), specifying in more detail potential processes involved ((i.e., types of processing and how the trauma is represented in memory) and providing supportive evidence. This helps explain a key experience for those suffering from PTSD, that of the current sense of threat, despite the threat being in the past. The metacognitive model of PTSD (Wells & Sembi, 2004a, 2004b) overlaps with the cognitive model (Ehlers & Clark, 2000) but emphasises less, how the trauma is represented in memory, and more how cognitions activated post-trauma can lead to PTSD.

These three theories explore factors and processes that are proposed to be relevant in the development of PTG (Tedeschi & Calhoun, 2004) (i.e., cognitive appraisals, cognitive processing and external/environmental factors). PTG will be discussed with links made to these models of PTSD, following a more detailed exploration of what the literature can tell us about the experience of trauma for parents of premature and hospitalised babies.

#### **1.5.3 Prevalence of PTSS in parents of premature or hospitalised babies.**



Rates of clinically significant levels of PTSS in parents of premature or hospitalised babies are reported to be between 8-34% (Ahlund, Clarke, Hill, & Thalange, 2009; Elklit, Hartvig, & Christiansen, 2007; Karatzias, Chouliara, Maxton, Freer, & Power, 2007; Lefkowitz et al., 2010; Shaw et al., 2009; Vanderbilt, Bushley, Young, & Frank, 2009) which appears comparable with rates reported in parents of children admitted to the paediatric intensive care unit (Balluffi et al., 2004; Colville & Gracey, 2006). This suggests that we might learn something about the experience for parents of premature and hospitalised babies from parents of children on the PICU.

Methodological differences within the NICU literature may account for some of the variation found in rates of PTSS such as the range of measurement tools used. This makes comparison between studies difficult. Time of measurement also ranges from 1-3 days to 3 years post-birth with studies providing little justification for the time period chosen. As discussed by many of the studies, small sample sizes, (e.g., min = 30; Holditch-Davis et al., 2003 and max = 127; Lefkowitz et al., 2010) also limits power, generalizability and the ability to explore potential predictors and changes over time. Potential reasons for these small sample sizes include the multiple challenges inherent with conducting research within a paediatric population such as, the environment and the physical and mental state of parents. Furthermore, a reliance on postal questionnaires may increase attrition rates. Despite research emphasising the key role that fathers play in the development of children and the support they provide for their partners (Phares, Lopez, Fields, Kamboukos, & Duhig, 2005), only four studies included fathers in the sample (Elklit et al., 2007; Lefkowitz et al., 2010; Pierrehumbert, Nicole, Muller-Nix, Forcada-Guex, & Ansermet, 2003; Shaw et al., 2009). This issue will be explored in more detail in the next section. Despite these limitations, studies demonstrate that parents can experience PTSS many

years after the birth and period of hospitalisation, indicating the potential severity of the problem.

#### **1.5.4 Differences in PTSS prevalence in mothers and fathers.**

The limited literature reporting trauma symptoms for parents following premature birth and/or hospitalisation, suggests that mothers are more likely to experience higher levels of trauma than fathers (Elklit et al., 2007; Lefkowitz et al., 2010; Pierrehumbert et al., 2003). A key question is why is this difference being found in the literature?

##### **1.5.4.1 *Evidence from general trauma literature.***

Evidence from the general trauma literature suggests that women are more likely to experience PTSD than men (Blain, Galovski, & Robinson, 2010; Holbrook, Hoyt, Stein, & Sieber, 2002) regardless of the trauma type. Differences in coping styles related to variations in affective, social-cognitive and neuroendocrinal factors have been suggested to contribute to different clinical profiles and rates of PTSD in men and women (Olf, Langeland, Draijer, & Gersons, 2007). Tamres, Janicki, and Helgeson (2002) discussed the role of biologically based sex differences and social-developmental factors related to gender socialisation as contributors to choice of coping strategies such as seeking social support. This is based on the theory that girls are socialised differently to boys in relation to emotional expression. Seeking social support is reported to be more common in women than men (Littlewood, Cramer, Hoekstra, & Humphrey, 1991; Pinelli, 2000; Tamres et al., 2002). Poor or a lack of social support has been related to worse trauma outcomes (Brewin et al., 2000; Ehlers & Clark, 2000; Ford, Ayers, & Bradley, 2010; Wells & Sembi, 2004a). Despite this evidence, women are generally reported to experience more trauma symptoms than men.

Reduced reporting of symptoms by men in studies could partially account for this, in keeping with the evidence that women tend to express emotion more than men (Tamres et al., 2002). Furthermore, Tamres et al. (2002) reported that women appraise stressors more severely than men which was hypothesised to result in a broader choice of coping strategies used by women. In particular, women were found to engage in rumination, seeking social support and positive self-talk, significantly more than men. It would have been of interest for Tamres et al. (2002) to relate these coping strategies to outcomes in order to evaluate effectiveness of the strategy. It is of interest, however, that the coping behaviours highlighted overlap with factors implicated in the development of PTSS and PTG, of which there is a debate about gender differences. It is argued to be important therefore to investigate these factors further, to understand the involvement of such coping strategies in the development of PTSD and PTG in men and women.

#### ***1.5.4.2 Evidence from target population.***

Focusing on the population of interest, Rowe and Jones (2010) reported that in the acute phase following the premature birth, mothers and fathers appraised the situation similarly in terms of stressfulness and used similar coping strategies. Mothers in this study did report more psychological distress than fathers despite these similar types of appraisals and use of coping strategies. Therefore, for this population, does the unique experience for mothers in terms of physically carrying the baby explain the increased rates of PTSS?

Pelchat, Lefebvre, and Perreault (2003) described how mothers' increased expectations about their new role and enhanced sense of responsibility for the care of the baby compared to fathers may contribute to their increased stress and trauma symptoms. The cognitive model of PTSD (Ehlers & Clark, 2000) predicts that individuals will suffer more stress and trauma symptoms if they appraise the event and their responses to the

event negatively. As mothers are physically carrying the child, it may be that mothers are more likely to blame themselves for having ‘failed’ in carrying their baby in the context of premature birth (Golish & Powell, 2003; Holditch-Davis et al., 2003; Hughes & McCollum, 1994; Jackson, Ternestedt, & Schollin, 2003; Kaaresen, Rønning, Ulvund, & Dahl, 2006). Furthermore, factors such as sense of control and pain can contribute to the experience of trauma for mothers (Czarnocka & Slade, 2000; Slade, 2006) and are arguably more central to the experience for mothers than fathers.

Lack of control, feelings of helplessness, fear of partner’s pain and fear related to the loss of their partner or child have also been linked to PTSS in fathers (Hanson, Hunter, Bormann, & Sobo, 2009; Nicholls & Ayers, 2007). It is also important to note that Shaw et al. (2009) found higher rates of PTSS in fathers (33%) compared to mothers (9%) at 4 months post-hospitalisation. The authors suggest that fathers may ‘delay’ their emotional response in order to support mothers in the early stages following birth and hospitalisation of the baby, a suggestion supported by literature exploring the experience of fathers and childbirth (Chandler & Field, 1997; Eriksson, Westman, & Hamberg, 2005).

Alternatively, the findings may be related to role changes for fathers, for example, returning to work and therefore participating less in the care of their child (Miles, Carlson, & Funk, 1996). Jackson et al. (2003) discussed fathers’ experiences of inadequacy related to having to return to work. In the context of cognitive models of anxiety, including the cognitive model of PTSD (Ehlers & Clark, 2000), this lack of exposure to the day to day tasks and experiences of caring for their child once home, compared to mothers, may maintain and/or increase anxiety levels, appraisals of inadequacy and feelings of guilt which could result in increased PTSS or symptoms of low mood and anxiety. For mothers, it is arguably more difficult to avoid reminders of the traumatic experience which may support their adjustment. Alternatively, the reduced exposure to potentially distressing

experiences related to a hospital environment may protect fathers from developing trauma symptoms.

Psychological models, therefore, may provide explanations for contrasting outcomes for mothers and fathers and more evidence is required in order to better understand the different trauma and adjustment processes for parents so that appropriate support and interventions can be offered. Overall though, the literature supports the finding that mothers experience higher levels of PTSS than fathers.

While it has been outlined that the circumstances are different for mothers and fathers in relation to childbirth which will have important implications for trauma outcomes, the psychological processes outlined by the cognitive model of PTSD (Ehlers & Clark, 2000) are argued to be relevant in understanding the experience for both mothers and fathers following premature birth and hospitalisation. Consistent with the message given by a number of authors (Blain et al., 2010; Phares et al., 2005; Sloan, Rowe, & Jones, 2008), there appears to be a need for more trauma research which compares mothers and fathers on measures of PTSS and potential predictors of PTSS (e.g., cognitive processing and coping strategies to inform psychological models and clinical practice).

### **1.5.5 Predictors of PTSS.**

The limited discussions within the literature about the predictors of PTSS in parents of premature babies are consistent with the small sample sizes gained in the majority of studies. Those studies that have attempted to explore such predictors present similar factors as the research on parents of term babies, including a family history of anxiety and depression (Lefkowitz et al., 2010) female gender, child handicap, distress (during hospitalisation, with staff and at homecoming) and the use of emotional and avoidant coping (Elklit et al., 2007). Lack of social support, negative post-traumatic cognitions and

levels of worry have been indicated as potential predictors of psychological distress in parents of term (Ford et al., 2010) and premature babies (Holditch-Davis et al., 2003; Singer, Davillier, Bruening, Hawkins, & Yamashita, 1996). There are no studies, however, that have investigated the role of social support and rumination in the development and maintenance of PTSD in parents of premature babies that have been hospitalised. Given the evidence for the role of such factors in psychological models of PTSD (Ehlers & Clark, 2000), as well as evidence from related samples (Ford et al., 2010) it is argued to be important for PTSD research with parents of premature and hospitalised babies to include such factors.

In addition to these cognitive and psycho-social factors, Elklit et al. (2007) also found that larger birth weight was associated with a higher level of traumatisation with parents experiencing significantly less emotional support from health care staff and from people in general compared to smaller birth weight infants. This is in contrast to Feeley et al. (2009) who reported lower birth weight along with a longer period of hospitalisation as associated with more severe PTSS in mothers. The retrospective nature of the design of Elklit et al. (2007) over a potential three year period and the use of regression analysis with a small sample ( $n = 66$ ) warrants the need for caution when interpreting the results. However, the study does raise interesting questions around potential differences in perceptions of coping based on objective factors such as infant birth weight and gestational age. Given the complexity of factors involved and the mixed findings within the research it may be that such objective factors such as birth weight, gestational age and time of hospitalisation cannot be assumed to indicate the levels of distress and trauma experienced by parents and this is consistent with evidence from relevant paediatric research (Balluffi et al., 2004; Bronner et al., 2009; Bronner et al., 2010; Holditch-Davis et al., 2003; Lefkowitz et al., 2010).

## **1.6 Positive Psychological Reactions to Trauma - Posttraumatic Growth (PTG)**

Having explored PTSS in mothers and fathers of premature or hospitalised babies, the focus of this chapter will now turn to the increasing literature exploring the potential positive reactions to trauma, frequently termed posttraumatic growth (PTG). First, PTG will be discussed in more detail outlining one of the dominant models within the growth literature (Tedeschi & Calhoun, 2004), the development of growth according to this model, and the factors involved in this. The relationship between growth and trauma symptoms and any potential overlaps in development will then be explored.

### **1.6.1 Overview of PTG.**

There is a growing interest in the potential positive psychological changes that individuals may experience following traumatic life events. This idea is not new and many early religious and philosophical writings refer to the transformative power of suffering (Tedeschi & Calhoun, 1995). The growing interest in these positive psychological changes fits with the more recent, 'positive psychology' movement which focuses on the understanding of positive psychological functioning as opposed to being purely focused on mental illness (Seligman & Csikszentmihalyi, 2000). This thesis will refer to posttraumatic growth (PTG), following the conceptualisation developed by Tedeschi and Calhoun (2004) within the functional-descriptive model, described as the most comprehensive theoretical model of growth (Joseph & Linley, 2006). Crucial in the conceptualisation of PTG is the idea that PTG describes a positive change or transformative outcome, beyond what was present before the trauma experience. Tedeschi and Calhoun (2004) argue that this idea differentiates it from other related concepts such as resilience, hardiness, optimism and sense of coherence which in general describe a resistance against or ability not to be damaged by adversity.

### **1.6.2 Domains of PTG.**

Based on interviews conducted with persons who had experienced stressful events and trauma as well as a review of the literature on responses to highly stressful events, the Posttraumatic Growth Inventory (PTGI) (Tedeschi & Calhoun, 1996) was developed. This measure identifies five factors which define different growth outcomes or processes: 1) relating to others; 2) new possibilities; 3) personal strength; 4) spiritual change; 5) appreciation of life. These five domains will now be discussed in more detail.

#### **1.6.2.1 *Relating to others.***

Closer, more intimate and meaningful relationships may develop as a result of a traumatic experience as individuals realise how important their relationships with people are. Affleck, Tennen, and Gershman (1985) described the responses of parents whose babies were hospitalised in the neonatal unit following perinatal medical complications, with 20% reporting closer family relationships and a greater appreciation of their child. Tedeschi and Calhoun (1996) discussed the role of self-disclosure driven by the need to talk through the consequences of their experiences in building closer relationships. The recognition of one's own vulnerability is highlighted as allowing people to express their emotions and accept help, therefore facilitating closer relationships. In addition, this change is discussed as leading to increased compassion and a greater understanding and emotional connection with other people (Collins, Taylor, & Skokan, 1990).

#### **1.6.2.2 *New possibilities.***



This domain refers to the identification of new possibilities for one's life or of the possibility of taking a new path in life. It includes developing new interests and the motivation to make changes in one's life (Tedeschi & Calhoun, 2004).

#### **1.6.2.3 *Personal strength.***

Experiencing a traumatic event can enable one to learn about one's strength and self-reliance (Tedeschi & Calhoun, 1996). Tedeschi and Calhoun (1995) discussed how individuals perceive that they have survived their most difficult challenge yet and therefore believe that they can cope with any future challenges. This relates to perceptions of control over events which has been linked to psychological well-being even if this control may be illusory (Taylor & Brown, 1988). People reporting such changes describe feeling more experienced about life (Joseph, Williams, & Yule, 1993), feeling stronger (Cordova, Cunningham, Carlson, & Andrykowski, 2001) and feeling more confident about dealing with future difficulties (Updegraff, Taylor, Kemeny, & Wyatt, 2002).

#### **1.6.2.4 *Spiritual change.***

Growth in this domain may occur for both the religious and non-religious. Religious faith may be strengthened or explored or there may be a greater engagement with existential questions (Tedeschi & Calhoun, 1995). The strengthening of religious beliefs or enhanced spiritual engagement may serve a number of purposes including that of gaining a sense of control, gaining comfort or intimacy from this new religious or spiritual relationship or an attempt to find meaning in what has happened (Pargament et al., 1990).

#### **1.6.2.5 *Appreciation of life.***

Tedeschi and Calhoun (1995) reported that many people gain a greater appreciation of their own and other people's lives and that part of this may be due to a reduced sense of invulnerability. There is recognition of how precious their time and their relationships are. An improved perspective on life was reported by 23% of mothers of sick new-borns (Affleck et al., 1985) and 71% of survivors of a cruise ship disaster reported living each day to the fullest (Joseph et al., 1993).

### **1.6.3 The development of PTG.**

An explanation of the model of PTG (Tedeschi & Calhoun, 2004) will now be given. Links are also made to models of PTSD to set the context for the later discussion exploring the relationship between PTSS and PTG.

The model of growth shown in Figure 1 (Tedeschi & Calhoun, 2004), outlines how a challenging or traumatic event may lead to PTG. The traumatic event needs to challenge a person's basic assumptions about the world and their place in it. This is in keeping with the Janoff-Bulman (1992) model of PTSD in that the event 'shatters' a person's understanding of themselves and the world so that the world is no longer comprehensible, meaningful or manageable.

The cognitive model of PTSD (Ehlers & Clark, 2000) also discusses the interactive role of prior experiences and beliefs and the characteristics of the traumatic event in the cognitive processing that follows. In the model of PTG the threat of the trauma is described as a 'seismic event' which challenges a person's assumptive world and life narrative and therefore can lead to psychological distress such as PTSD. In order to manage the initial distress caused by this 'seismic' challenge, the model proposes that automatic cognitive processing occurs in the form of intrusive thoughts and/or images. The cognitive model of PTSD proposes that rumination may strengthen problematic

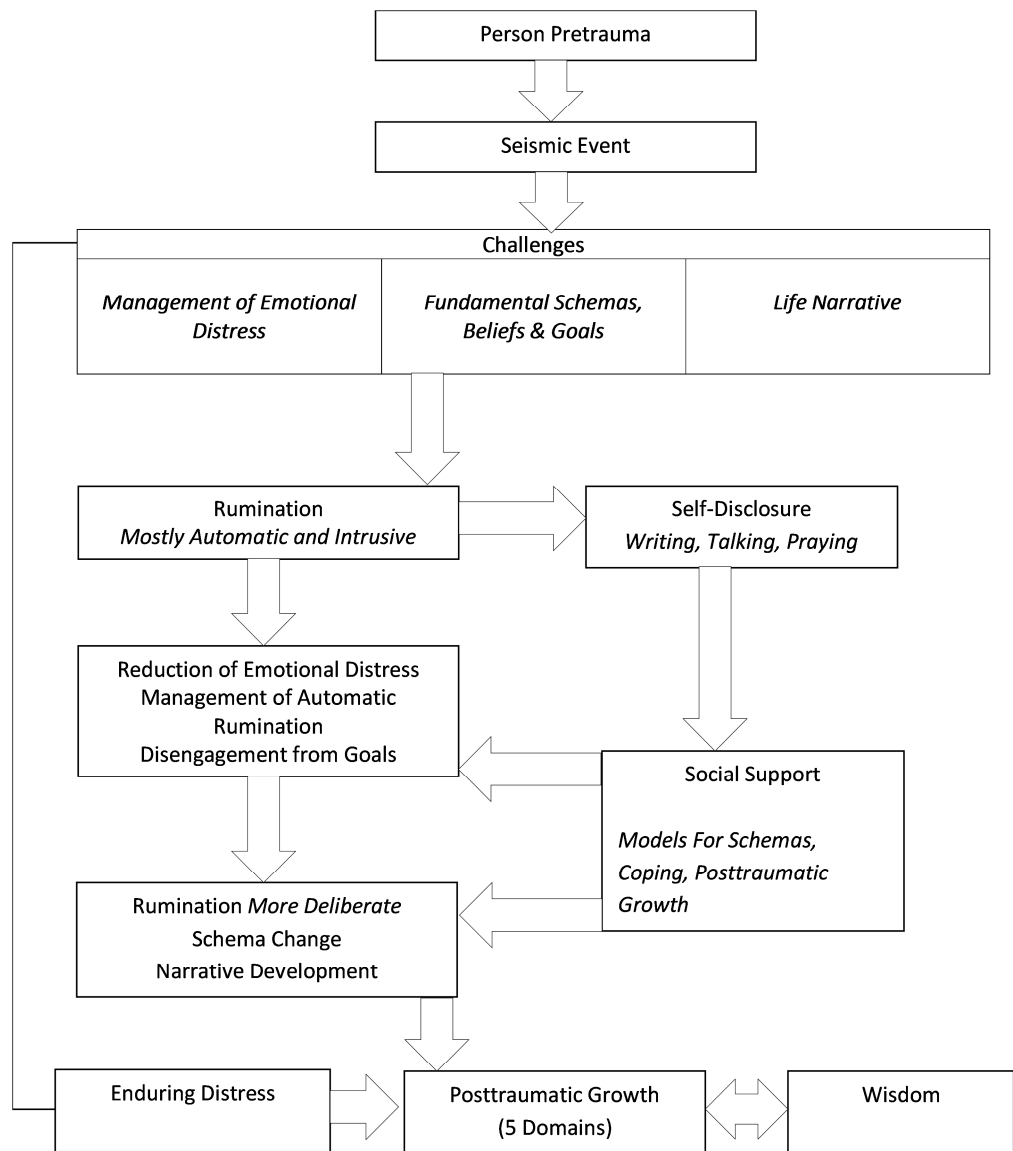
appraisals of the trauma, maintaining symptoms (Ehlers & Clark, 2000), while the metacognitive model (Wells & Sembi, 2004a) describes how rumination, triggered by maladaptive metacognitions, blocks normal adaptive processing. This is partially consistent with the PTG model which suggests that intrusive rumination is likely to be positively correlated with trauma symptoms whilst also however being an initial stage in the development of growth.

Pre trauma factors such as personality and coping styles are suggested to influence how a person may respond initially to trauma with some early success in coping being a precursor to later growth. This early success may be facilitated by self-disclosure of emotions and experiences in a variety of forms such as through talking, writing or praying. The model of PTG describes how the quality of the support received is crucial in the development of growth, with consistent social support facilitating self-disclosure. Cordova et al. (2001) reported that cognitive processing in cancer patients was inhibited when friends and family did not wish to hear from patients about their illness. This reduced cognitive processing was associated with less PTG. Weiss (2002) suggested that tolerance of distress by both the patient and sources of support is important in sustaining cognitive processing. This is in keeping with the description of growth by Tedeschi and Calhoun (2004) of “some degree of psychological upset or distress (being) necessary not only to set the process of growth in motion, but also some enduring upset may accompany the enhancement and maintenance of posttraumatic growth” (p. 12-13).

Furthermore, social support is suggested to play another crucial role in the development of growth in terms of offering people new perspectives, beliefs and metaphors that can support the revision of pre trauma schemas, necessary for the experience of growth (Calhoun & Tedeschi, 1999). This is consistent with the cognitive model of PTSD where good social support is emphasised as being important in weakening

negative appraisals of the trauma (Ehlers & Clark, 2000). Revision of pre trauma schemas is vital in order to move away from a focus on the discrepancy between past goals, beliefs and schemas that cannot accommodate the trauma and therefore the person's current position. In order to experience growth, there is the need for people to disengage from these previous goals and assumptions and begin to develop new goals and meanings. The model suggests that consistent social support may help facilitate this process. This process is described as being visible in terms of the shift from automatic, more intrusive processing or rumination towards more deliberate rumination. This deliberate rumination involves reflection and a more proactive search for meaning which helps the reconstruction of assumptions and beliefs about the self and the world.

PTG in the model in Figure 1 is suggested to be both a process and outcome, although the lack of longitudinal studies in this area makes mapping the temporal course of growth difficult. There is an assumption that growth is an active process, experienced alongside enduring distress and connected to the development of wisdom and changes in one's life narrative.



*Figure 1.* The model of posttraumatic growth. From “Posttraumatic growth: Conceptual foundations and empirical evidence”, by R. Tedeschi and L. Calhoun, 2004, *Psychological Inquiry*, 15, p. 7.

### **1.6.4 Critique of PTG Model.**

While the Tedeschi and Calhoun (2004) model of PTG has a lot of face validity, it has been described as more of a descriptive model as opposed to explanatory, with aspects of the model hard to test empirically as they have not been fully specified (Joseph & Linley, 2006). The model describes that ‘successful coping’ in the early stages of a trauma supports adaptation and facilitates a shift from intrusive to deliberate rumination. It may be argued, however, that the model does not make explicit enough what this successful coping looks like. In Figure 1, one of the key challenges highlighted following the seismic event is that of management of emotional distress. Aldwin and Levenson (2004) criticised the model for a lack of emphasis on or specification of the type of coping responses that are helpful in this management of emotional distress. The PTG model suggests that this is something different to the cognitive processing described in the model within the next stage of the process. Tedeschi and Calhoun (2004) highlight that the degree to which someone is cognitively engaged by the crisis is central to PTG. Therefore, the cognitive aspects of the model seem well defined compared to the affective processes at work. This is particularly when comparing this model to a more recently published model of growth and trauma by Joseph, Murphy, and Regal (2012) called the affective-cognitive processing model of PTG. While this largely follows the model outlined by Tedeschi and Calhoun (2004), which validates the key processes outlined by this model, Joseph et al. (2012) have developed it further, specifying more clearly the interactions between cognitive processing, affective experience and coping responses and highlighting the continuous, cycling nature of this. This makes the model easier to test empirically and clinically apply.

Within the growth literature, models of growth as purely coping strategies have been put forward, for example, PTG within a meaning making coping process (Park & Folkman, 1997) and PTG as one form of positive illusion (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000) with some authors suggesting that PTG is purely a coping mechanism. Tedeschi and Calhoun (2004) argue that PTG in their model is both a coping strategy and an outcome of coping. Arguably these differences are not clearly differentiated within the model however.

PTG has been argued to represent a self-enhancing cognitive bias or unhelpful illusion, rather than a genuine change in experience. Positive correlations between PTG and unhelpful coping strategies such as avoidance, denial and measures of distress could be argued to lend support to this idea. (Zoellner & Maercker, 2006). Tedeschi, Calhoun, and Cann (2007) countered this by arguing that PTG does not correlate with measures of social desirability (Weinrib, Rothrock, Johnsen, & Lutgendorf, 2006). It has also been argued that PTG may be underreported using quantitative measures (Smith & Cook, 2004) and that self-reported growth tends to correlate with observer data (Park, Cohen, & Murch, 1996). In contrast to this latter point, Frazier et al. (2009) found that perceived PTG was only weakly related to actual PTG. This relationship was moderated by levels of distress with less distress resulting in a moderate correlation, highlighting the need to be cautious when interpreting self-report measures of PTG, particularly when there are high levels of distress. In addition, the tendency to derogate past selves to maintain a favourable perception of current selves has been discussed in relation to the concept of PTG (Wilson & Ross, 2001). Such measurement issues are significant when empirically testing models such as this one.

It has been argued that research efforts have been biased towards the assumption of PTG as a positive constructive concept, with less research focused on the potential

unhelpful role of PTG (Zoellner & Maercker, 2006). The Janus- Face model (Maercker & Zoellner, 2004) suggests something in between; that an initial illusory experience of PTG supports coping success as it helps counter-balance emotional distress but that with time and increasing coping success, a more constructive PTG experience develops with there being less of a need for this illusory side of PTG. The Janus-Face model (Maercker & Zoellner, 2004) emphasises the role of deliberate rumination on bringing about this coping success and shift away from a maladaptive form of PTG. It could be argued that this model accounts better for some of the findings in the literature with regards positive correlations with maladaptive coping strategies than the Tedeschi and Calhoun (2004) model of PTG. Tedeschi and Calhoun (2004) argue, however, that these associations are evidence of distress and the associated coping strategies, as precipitators of the functional growth process.

The model of PTG (Tedeschi & Calhoun, 2004) may also underestimate the role of positive emotions as predictors of PTG, with evidence suggesting that the emotional facet of openness to experience is linked to PTG as opposed the cognitive or behavioural side of openness (Zoellner & Maercker, 2006). Furthermore a study by Fredrickson, Tugade, Waugh, and Larkin (2003) highlighted that positive emotions in the aftermath of the 9/11 crisis fully accounted for the relationship between pre-crisis resilience and post-crisis growth. Therefore, significant affective aspects of the PTG process may be missing from this model.

The emphasis on the need for a 'seismic' or highly traumatic event to occur in order to develop PTG has been questioned by some authors who present evidence of PTG in individuals having experienced mildly stressful events or even positive events (e.g. becoming parents, marriage, profound religious experiences) (Aldwin & Levenson, 2004). It may be that these events have the potential to challenge core beliefs held about the self



and the world and so could set in motion cognitive processing and coping responses that initiate PTG. Arguable, however, this experience is qualitatively different to the experience of growth following a negative event, because of the lack of distress. It may be argued, therefore, that growth related to positive or mildly stressful events is conceptually different to PTG, as PTG by definition as stated in the model, requires a certain level of distress in order to develop (Joseph et al., 2012; Tedeschi & Calhoun, 2004). It should also be noted that, an event perceived as mildly stressful by one person may be considered a seismic event by another, based on factors such as previous life experiences, beliefs and schemas as outlined by the model (Tedeschi & Calhoun, 2004). Therefore the model benefits from being able to be applied to a range of life circumstances as the emphasis is on the response of the individual to this event, rather than the event itself.

In conclusion, the PTG model by Tedeschi and Calhoun (2004) may be considered to be a well described model of the main processes suggested to be involved in the development of PTG. The model may be criticised for its emphasis on cognitive processing as opposed to other forms of coping response, particularly affective responses. The model could benefit from further specification of what initial ‘successful coping’ looks like as this aspect of the model is particularly difficult to test due to its generality. However, the differentiation between different forms of cognitive processing is a central and testable part of the model which sets it apart from other conceptualisations of PTG. While forms of growth may be found following non-traumatic or positive experiences, it is argued that this is conceptually different to PTG. As emphasised by Tedeschi and Calhoun (2004), in order to get PTG, there needs to be some level of distress. More recent models of PTG (i.e., the affective-cognitive processing model; Joseph et al., 2012)) support the key concepts outlined by Tedeschi and Calhoun (2004) (e.g., distress as the engine of PTG, PTG coming from the challenge to previously held beliefs and the role of cognitive

processing in facilitating PTG) but elaborate further on the role of affective, cognitive and coping responses on growth development. This highlights the significant influence the PTG model by Tedeschi and Calhoun (2004) has had on the wider growth literature. Therefore although the model may have its limitations it is argued to be an important model to test empirically.

### **1.6.5 Comparison of PTSD models and PTG model.**

The cognitive model of PTSD (Ehlers & Clark, 2000) describes how rumination may maintain PTSS by reinforcing negative cognitive appraisals. The metacognitive model of PTSD describes how rumination hinders natural cognitive processing (Wells & Sembi, 2004a, 2004b). It may be argued that the model of PTG compliments these models of PTSD as it supports the initial assertion that intrusions are a natural response to a trauma and is related to on-going distress but then extends this by differentiating between intrusive and deliberate rumination. The model therefore extends these models of PTSD by proposing how processes important in our understanding of PTSD may be involved in initiating a new process of PTG, a process potentially related to but also separate from PTSD.

Both the cognitive (Ehlers & Clark, 2000) and metacognitive models (Wells & Sembi, 2004a, 2004b) of PTSD suggest that difficulties arise when individuals interpret initial, often normal responses to a trauma in a threatening way and/or use inappropriate coping strategies. Furthermore, negative or a lack of social support is cited by both models of PTSD to be potentially harmful in terms of reinforcing negative beliefs about the self. Inherent in this is the idea that good quality social support may support positive cognitive changes and reductions in PTSS. Similarly, the PTG model (Tedeschi & Calhoun, 2004) proposes that social support facilitates management of intrusive rumination, reductions in

distress and cognitive shifts, leading to PTG. There is, therefore, much overlap between models of PTSD (Ehlers & Clark, 2000; Wells & Sembi, 2004a, 2004b) and the model of PTG (Tedeschi & Calhoun, 2004).

A key difference is the differentiation between intrusive and deliberate rumination in explaining changes in cognitive processing and progression towards growth. It may be that the model of PTG (Tedeschi & Calhoun, 2004) can provide information which would be helpful to incorporate into or emphasise more strongly in models of PTSD (Ehlers & Clark, 2000; Wells & Sembi, 2004a), with the potential to influence clinical practice. Research which focuses both on PTSS and PTG, such as this study, may facilitate this process. The core factors related to the development of PTG and cited in models of PTSD (Ehlers & Clark, 2000; Wells & Sembi, 2004a) are discussed below, providing evidence for why they are a focus within this study.

#### **1.6.6 Factors related to the development of PTG.**

As figure 1 indicates, a number of factors are suggested to be related to the development of growth including gender, personality characteristics and schema/belief systems as well as more proximal factors including coping style, rumination, self-disclosure and social support. This study focuses on the roles of rumination and social support and gender. This is because, as already discussed, rumination and social support are significant in the development and maintenance of PTSD and given the interest of this current study in the relationship between PTSD and PTG, it is of theoretical interest to focus on variables that are cited as important in both trauma and growth models. Gender differences in PTG are also discussed further, given the interesting differences reported for PTSD and the importance of understanding the experiences of both mothers and fathers.

The literature exploring the role of rumination type, social support and gender in the development of growth will now be discussed in more detail.

#### **1.6.6.1 *Rumination.***

Rumination as defined by the model of PTG (Tedeschi & Calhoun, 2004) is a form of cognitive processing. The term rumination may traditionally be thought of as relating to negative psychopathology such as depression (Nolen-Hoeksema, McBride, & Larson, 1997). Martin and Tesser (1996) however described “several varieties of recurrent thinking, including making sense, problem solving, reminiscence, and anticipation” (p. 192). In accordance with this, the general definition of rumination is neutral, that of ‘chewing the cud’ or ‘to meditate or ponder on.’ Tedeschi and Calhoun (2004) therefore differentiated between two types of rumination: intrusive and deliberate in order to better understand the cognitive processing in the development of PTG and distress. Intrusive rumination was defined by Cann et al. (2011) as “unsolicited invasions of one’s cognitive world-thoughts about an experience that one does not choose to bring to mind” (p. 138). Deliberate rumination in contrast is voluntary and more purposeful, attempting to understand events and their meaning.

In support of the model of PTG which suggests that intrusive rumination is indicative of cognitive processing necessary for PTG, there is growing evidence of a positive association between intrusions and PTG (Helgeson, Reynolds, & Tomich, 2006; Linley & Joseph, 2004; Shakespeare-Finch & De Dassel, 2009; Taku, Calhoun, Cann, & Tedeschi, 2008; Taku et al., 2007). There is a need to break this down further as research suggests that intrusive rumination impedes cognitive processing (increasing or maintaining distress) whereas deliberate rumination is suggested to facilitate cognitive processing (increasing PTG) (Cann, Calhoun, Tedeschi, & Solomon, 2010; Joseph, 2000; Nightingale,

Sher, & Hansen, 2010; Siegle, Moore, & Thase, 2004; Stockton, Hunt, & Joseph, 2011; Taku et al., 2008). Some studies have also investigated the role of time of cognitive processing in understanding the pathways to distress and PTG. Nightingale et al. (2010) support the model of PTG by reporting that intrusive rumination soon after the trauma event predicted both PTSS and PTG. On the other hand, deliberate rumination soon after the event was more predictive of PTSS than PTG. This may suggest that engaging in purposeful searching for meaning too soon may represent an ‘illusory’ or self-deceptive side of growth (Maercker & Zoellner, 2004). In contrast, however, Taku, Cann, Tedeschi, and Calhoun (2009) reported that deliberate rumination soon after the event was more predictive of PTG, which would support the assertion by Tedeschi and Calhoun (2004) that early coping success is important in the development of PTG.

In summary, the model of PTG extends our understanding of ruminative cognitive processing from that of which is discussed within PTSD models. Support for the value in differentiating between intrusive and deliberate types of rumination comes from a range of studies. Overall, the studies reviewed demonstrate the positive relationship between deliberate rumination and PTG. There are some differences reported in relation to whether deliberate rumination soon after the event or more recently is most strongly related to growth with the suggestion that deliberate rumination soon after the event may represent the illusory nature of growth or be unhelpful in some way. Intrusive rumination is reported to be related to distress but also related less strongly to growth, consistent with the model of PTG (Tedeschi & Calhoun, 2004).

#### **1.6.6.2 Social support.**

The model of PTG describes the importance of social support in facilitating the individual to disengage from previous goals and engage in deliberate rumination, supporting the development of new narratives which incorporate the trauma experience. Evidence for the role of social support in the model comes from a number of studies where a positive relationship between social support and PTG has been reported (Cieslak et al., 2009; Cohen & Numa, 2011; Frazier, Tashiro, Berman, Steger, & Long, 2004; Hungerbuehler, Vollrath, & Landolt, 2011; Leung et al., 2010; Maguen, Vogt, King, King, & Litz, 2006; Özlü, 2010; Tallman, Shaw, Schultz, & Altmaier, 2010).

There is less evidence for the models' hypothesis with regards the relationship between social support and rumination. Few studies have investigated this relationship explicitly. Studies have either reported a positive relationship between social support and rumination (Morris & Shakespeare-Finch, 2011; Rimé, Páez, Basabe, & Martínez, 2010), a negative (but non-significant) relationship (Benetato, 2011) or no relationship (Cryder, Kilmer, Tedeschi, & Calhoun, 2006). These few studies include investigation of children (Cryder et al., 2006), the use of non-standardised measures (Rimé et al., 2010) and a range of populations, making it difficult to draw valid conclusions. The need for research testing this aspect of the PTG model is indicated by researchers such as Taku et al. (2008) and Taku, Kilmer, Cann, Tedeschi, and Calhoun (2012) who having reported a significant relationship between deliberate rumination and PTG; suggest that future studies should explore which factors may facilitate engagement with deliberate rumination. Consistent with the model of PTG, it is argued that social support is a contender for this.

Social support may also be operationalized in different ways, for example, Love and Sabiston (2011) described perceived social support (perceived quality or availability of

support), social networks (the number of people providing support) and supportive behaviours (emotional, informational). Perceived social support is more important when considering well-being and adjustment outcomes than social network size and form of support (Cohen., 2004; Marlow, Cartmill, Cieplucha, & Lowrie, 2003), with satisfaction with social support predictive of later growth, (Love & Sabiston, 2011; Park et al., 1996).

Despite the evidence suggesting a positive relationship between social support and PTG, Joseph et al. (1993) and O'Sullivan and Whelan (2011) reported no relationship. Methodological limitations may reduce the validity of these studies however. O'Sullivan and Whelan (2011) questioned the use of the Crisis Support Scale (Elklit, Schmidt Pedersen, & Jind, 2001) with telephone counsellors suggesting that it may not have included sources of support most salient to telephone counsellors. The power of Joseph et al. (1993) to find an effect may also be questioned due to their small sample size ( $n = 35$ ).

Overall, the studies reviewed reported a positive relationship between social support and growth whether this relationship is direct or indirect. Studies differed in the dimension of social support considered and there does not seem to be a clear consensus on which dimension is most relevant in the development of growth. There is also a gap in the literature when it comes to understanding the role that social support and rumination might play in the development of PTG.

#### **1.6.6.3 Gender.**

Support for the conclusion that women tend to experience more PTG than men comes from studies using student populations with a range of traumatic events (Gerber, Boals, & Schuettler, 2011; Park et al., 1996; Rimé et al., 2010; Schuettler & Boals, 2011; Shigemoto & Poyrazli, 2011; Tedeschi & Calhoun, 1996), women with breast cancer compared to their husbands (Weiss, 2002) and Tibetan refugees (Hussain & Bhushan,

2011). In addition, studies exploring PTG in parents of premature babies support this conclusion (Buchi et al., 2009; Buchi et al., 2007; Jenewein et al., 2008; Spielman & Taubman-Ben-Ari, 2009). In contrast Polatinsky and Esprey (2000) reported no gender differences in levels of PTG between parents bereaved of a child. This study is limited by its small sample size however (n=67 of which 18 were fathers). Other more recent studies have also reported no gender differences (Cieslak et al., 2009; Kilmer & Gil-Rivas, 2010; Love & Sabiston, 2011; Meyerson, Grant, Carter, & Kilmer, 2011; Shigemoto & Poyrazli, 2011). A number of these studies focus on children and adolescents which may not be comparable to the process of growth in adults.

A meta-analysis (Vishnevsky, Cann, Calhoun, Tedeschi, & Demakis, 2010) identified age as a significant moderator with women reporting more growth with increasing age. The authors hypothesised that this may be because with increasing age there are more chances to experience potential trauma such as bereavements. It is not clear, however, why this would be different for men? It may be that similar factors discussed in relation to gender differences in the presentation of trauma symptoms are important here, such as the role of cognitive appraisals and choice of coping strategies. As discussed previously, Tamres et al. (2002) reported that women appraise stressors more severely than men. Whether this is for biological, developmental, psycho-social reasons or a combination, this may suggest that there has been more of a challenge to core beliefs which according to the model of PTG is necessary for the potential experience of PTG.

Furthermore, women are reported to use coping strategies that are proposed to be important in the development of PTG, more than men. These include deliberate rumination (Treynor, Gonzalez, & Nolen-Hoeksema, 2003), expressing emotion (Tamres et al., 2002) and seeking social support (Pinelli, 2000). Again the bases for these differences are likely to be complex and biopsychosocial. Gender socialisation may be



argued to account for differences in choice of coping strategies between men and women. It could be argued that the concept of PTG itself is more consistent with the way in which girls are socialised; or it might be that the way in which PTG is measured is biased towards endorsement by women compared to men. Vishnevsky et al. (2010) argued this is not the case based on similar effect sizes across both the PTGI and Stress-Related Growth Scale (SRGS) (Park et al., 1996). Regardless of the type of self-report questionnaire used, men may experience comparable levels to women but be less likely to report this, potentially related to conforming to gender based roles within society.

As discussed previously, the unique position of women as carriers of the baby may increase the sense of responsibility (Pelchat et al., 2003) and centrality of the event (Boals, 2010) for women, compared to men. Thus the event of premature birth and hospitalisation of the baby may consequently be more traumatic for women and thus set in motion a pathway for potential PTG. The fathers' natural distance from this and reported marginalisation (Jackson et al., 2003; Lindberg, Axelsson, & Öhring, 2007; Sloan et al., 2008) may reduce the likelihood of trauma for men and thus PTG. This is partly based on the assumption that PTSS is positively related to PTG, which cannot be assumed and will be discussed in the next section.

The overall consensus appears to be that women are more likely to experience PTG than men. Similarly to the trauma literature, differences in cognitive appraisals, cognitive processing and the use of different coping strategies may partly explain these differences. The studies cited here do not comprehensively investigate the reasons for gender differences and so such hypotheses require further testing. Different findings in relation to gender and PTG across studies reviewed may also be accounted for by methodological differences and small sample sizes.

## **1.7 Relationship between PTG and PTSD**

As discussed previously, the model of PTG outlines how growth is triggered by a traumatic experience that challenges a person's fundamental assumptions about the self and the world (Tedeschi & Calhoun, 2004). The premise is that there must be some distress before there can be growth. The relationship between distress ((i.e., PTSD) and PTG has been explored by many studies with different conclusions. The model of PTG however does not align itself with one explanation of this relationship but rather is open to the possibility of different types of relationships between these variables. The model does however state that with increasing PTG there is not necessarily decreasing distress. The following questions therefore apply; are we looking at two separate factors that can coexist, or factors that are related? This will be discussed below.

### **1.7.1 Evidence for a positive relationship.**

The majority of studies exploring the relationship between PTG and PTSD have reported a positive relationship, investigating a range of trauma types: adolescent survivors of cancer (Barakat, Alderfer, & Kazak, 2006) hurricane survivors with HIV (Cieslak et al., 2009), former Israeli prisoners (Dekel, Mandl, & Solomon, 2011), individuals who experienced serious illness as a child (Devine, Reed-Knight, Loiselle, Fenton, & Blount, 2010), survivors of child sexual abuse (Lev-Wiesel, Amir, & Besser, 2005; Shakespeare-Finch & De Dassel, 2009), Israeli citizens' exposed to terror (Levine, Laufer, Stein, Hamama-Raz, & Solomon, 2009), having a relative with a serious illness (Loiselle, Devine, Reed-Knight, & Blount, 2011), receiving a diagnosis of HIV (Nightingale et al., 2010), motor vehicle accident survivors (Nishi, Matsuoka, & Kim, 2010; Zoellner, Rabe, Karl, & Maercker, 2008), US citizens in relation to the 9/11 attacks (Park, Aldwin, Fenster, & Snyder, 2008), women with cancer (Posluszny, Baum, Edwards, & Dew, 2011),

bereaved students (Taku et al., 2008) and adolescents following an earthquake (Yu et al., 2010). These studies give support to the idea that distress is required for PTG, consistent with the model of PTG.

### **1.7.2 Evidence for a negative relationship.**

In comparison, a small number of studies have reported a negative relationship between PTSD and PTG, suggesting that with increasing distress, there is little room for growth and that growth may help to ameliorate symptoms of distress (Cole & Lynn, 2010; Hagenaars & van Minnen, 2010; Hall et al., 2008; Lev-Wiesel & Amir, 2003). There was some variation however when the dimensions of PTG and PTSS were compared, with arousal and re-experiencing being positively correlated with PTG (Hagenaars & van Minnen, 2010; Lev-Wiesel & Amir, 2003; Shakespeare-Finch & De Dassel, 2009). Such differences may reflect the use of different types of cognitive processing and/or different coping strategies (e.g., rumination, self-disclosure, seeking social support). This is consistent with authors who have suggested the importance of looking beyond full scale scores when trying to understand the relationship between PTG and PTSS (Morris, Shakespeare-Finch, Rieck, & Newbery, 2005). This makes theoretical sense when considering the different components that make up both of these constructs. The relationship between PTG and PTSS may also change over time, for example, PTG is suggested to increase with time (Davis, Nolen-Hoeksema, & Larson, 1998; Polatinsky & Esprey, 2000) and differ depending on trauma type. The studies cited in this section differ hugely in terms of measurement time points and population type, highlighting the difficulty in unpicking the relationship between these variables.

### **1.7.3 Evidence for a curvilinear relationship.**

A number of authors have also questioned the focus of a linear relationship between PTG and PTSD and provided evidence for a curvilinear or quadratic relationship (Kleim & Ehlers, 2009; Kunst, 2010; Levine, Laufer, Hamama-Raz, Stein, & Solomon, 2008; McCaslin et al., 2009; Solomon & Dekel, 2007). These studies suggest that individuals with either low or high levels of distress show the lowest levels of growth (Kleim & Ehlers, 2009). This is because either the experience does not challenge core beliefs and does not trigger a distress response and potential for PTG, as suggested by Tedeschi and Calhoun (2004) or distress levels are so high, they undermine the development of PTG (L. D. Butler et al., 2005). Those with moderate levels of distress show the highest levels of growth (Solomon & Dekel, 2007).

It may be that the variety of outcomes reported reflects the fact that some studies may be reporting one part of this curvilinear relationship, constrained by a cross-sectional design as well as a narrowed spectrum of trauma symptom severity. Many of the studies cited here benefitted from a prospective design and large sample size (Kleim & Ehlers, 2009; Kunst, 2010; Solomon & Dekel, 2007). It should be noted that McCaslin et al. (2009) and Levine et al. (2008) used adolescent populations and so some caution should be taken generalising these outcomes to adult populations.

### **1.7.4 Evidence for no relationship.**

Lastly, a small number of studies reported no relationship between PTG and distress (Boals, Steward, & Schuettler, 2010; Cordova et al., 2007; Grubaugh & Resick, 2007; Salsman, Segerstrom, Brechting, Carlson, & Andrykowski, 2009; Sawyer & Ayers, 2009; Shakespeare-Finch & Armstrong, 2010). This suggests that PTSD and PTG may coexist, but that they do not have a direct influence on each other.

Potential methodological reasons for finding no relationship include the use of participants with too high PTSS levels (Grubaugh & Resick, 2007; Shakespeare-Finch & Armstrong, 2010), therefore potentially blocking PTG. It may have been that uncontrolled variables obscured the relationship between PTSS and PTG, for example depression was not controlled for in a couple of studies (Sawyer & Ayers, 2009; Shakespeare-Finch & Armstrong, 2010). Counter to this, Grubaugh and Resick (2007) reported no relationship between PTG and PTSS in both the (PTSD only) and (PTSD & Depressed) groups of sexual assault survivors.

### **1.7.5 Summary.**

The majority of the studies discussed are cross-sectional, meaning that causal relationships cannot be identified and that only a snap shot is given, making conclusions about the relationship between two complex factors difficult to ascertain. The majority of the studies cited, report a positive correlation between PTG and PTSD, however a significant minority also report a negative or curvilinear relationship or no relationship. Mixed findings may reflect differential relationships within the constructs of PTG and PTSS, highlighting the need to look beyond total scores. On the other hand, it may be that the variety of outcomes reported reflects the fact that some studies may be reporting one part of a curvilinear relationship. Zoellner et al. (2008) suggested that the lack of a systematic relationship between PTSD and PTG in the literature demonstrates the multidimensional nature of PTG as well as the role of different coping procedures at different time points during adjustment. For example cognitive processing may change over time with different relationships reported at different time points between rumination type (intrusive & deliberate) and PTG and PTSD.

Tedeschi and Calhoun (2004) emphasise the point that PTG is not the same as a decrease in distress. A negative relationship may be found, but this is not predicted by the model. The model does, however, highlight the role of some distress in triggering and maintaining PTG, suggesting a relationship of some degree as opposed to complete independence. Given the mixed findings in the literature, it is considered to be important to explore this relationship within this study to contribute to the evidence base and consider the impact of this relationship for parents of premature babies that have been hospitalised.

The next section reviews the PTG and PTSD literature on parents in paediatric settings, before providing a rationale for the current study and the research questions posed.

### **1.8 PTG and PTSS in Parents of Children in Paediatric Settings**

Given the relative infancy of the focus on PTSS in parents in paediatric settings it is of interest to find out the extent to which PTG has been explored in this population. Based on the literature reviewed previously it may be suggested that where there is trauma, there is the potential for growth. The literature review below focuses on PTG and PTSD in parents of ill children and babies. This review will be broken down into studies which investigate PTG and studies which explore both PTG and PTSD. This is of interest given the mixed findings with regards to the relationship between these variables in the general literature. Furthermore, gaining a better understanding of the potentially mixed experience for parents in these settings may help improve the support these parents are offered.

### **1.8.1 Literature review of PTG and PTSS in parents of children in paediatric settings.**

A search was performed most recently in April 2013 using PsychINFO and Medline using the following search terms, “*posttraumatic growth*”, “*post traumatic growth*”, *PTG*, “*posttraumatic stress*”, “*post traumatic stress*”, *PTSS*, *PTSD*, *parent\**, *maternal*, *paternal*, *mother\**, *father\**, *child\**, *adolescen\**, *infant\**, *bab\**, *premature*, *preterm* to identify studies that explored PTSS and PTG in parents of children and babies in paediatric settings. This literature search also included a search using Google Scholar for relevant literature and a hand search of the most frequently cited journals (Journal of Loss and Trauma, Journal of Paediatric Psychology, Journal of Traumatic Stress).

The search excluded articles which:

1. were not published in peer reviewed journals (such as dissertations);
2. did not use the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996)
3. did not assess PTG in parents
4. were investigating bereaved parents only
5. were not investigating families within a paediatric setting

The search identified eight studies that met the criteria (see table 1).

**Table 1. Studies reporting PTG only and PTG & PTSS in parents of children in paediatric settings**

Reference	Participants	Design	Other variables examined	Results
PTG Only				
Barr (2011)	Mothers (n = 85) & fathers (n = 73) of infants hospitalised on NICU	Prospective (1 month & 1 year)	Stressfulness of NICU, Coping, Guilt & Shame Proneness, Fear of Death	PTGI mean score mothers = 55, Mean score fathers = 47.7. No significant effect of gender. Coping by positive reappraisal strongest predictor of growth.
Hungerbuehler et al. (2011)	Mothers (n=67) & Fathers (n=59) of a child previously diagnosed with cancer or diabetes	Prospective (1 month & 3 years post diagnosis)	Family functioning, psychological distress, medical characteristics, socioeconomic status	PTG Item Mean Mothers = 2.39 PTG Item Mean Fathers = 1.92 Significant effect of gender and diagnosis (parents of children with cancer higher PTG scores) 67% reported moderate growth.
Jenewein et al. (2008)	Parents of extremely premature infants (24-26 weeks gestation) who survived (n = 38) & parents of premature infants who did not survive (n = 54)	Cross-sectional (>3 years since birth)	Anxiety, Depression, Cognitive and psychomotor functioning of surviving child	PTGI mean score – Bereaved: Mothers = 26.7 Fathers = 19 PTGI mean score – non-bereaved: Mothers = 20.4 Fathers = 19.2 PTG sig. higher in bereaved mothers
Schneider, Steele, Cadell, and Hemsworth (2011)	Mothers (n = 216), Fathers (n = 49) & Grandmothers (n = 8) of children with Life Limiting Illnesses.	Cross-sectional	Meaning in caregiving, self-esteem, optimism, spirituality, Depression, Burden	PTGI item mean score – Mothers/Grandmothers = 3.13 PTGI item mean score – Fathers = 2.53 Gender Difference statistically significant ( $p = .000$ )



Reference	Participants	Design	Other variables examined	Results
PTG Only continued				
Spielman and Taubman-Ben-Ari (2009)	Parents of premature infants ( n = 49) & parents of term infants ( n = 50)	Cross-sectional (1 month post birth)	Parenting self-efficacy, Self-esteem, Attachment style, Infant temperament	PTGI item mean score – Preterm = 3.00. PTGI item mean score – Term = 2.67 Mothers reported significantly higher PTGI scores than fathers (3.06 versus 2.61). Perception of temperament related to growth in mothers.
PTG & PTSS				
Best, Streisand, Catania, and Kazak (2001)	Mothers (n=66) & fathers (n = 47) of children treated for leukaemia	Prospective follow up study of participants from treatment trial in 1991-1995	Anxiety, Avoidance, Depression, Perception of distress, Social network, Self-efficacy	Anxiety and distress at time of treatment predictive of later PTSS. Positive relationship between PTG and Anxiety & Avoidance
Colville and Cream (2009)	Mothers (n=39) and fathers (n=11) of children treated in a Paediatric Intensive Care Unit (PICU)	Prospective cross-sectional cohort study 4 months after discharge.	Anxiety & Depression	Mean PTGI total score = 49 Median IES score = 21.5 Curvilinear relationship between PTG and PTSS
Michel, Taylor, Absolom, and Eiser (2010)	Mothers (n=40) and fathers (n=5) of child cancer survivors	Cross-sectional (>2 years since diagnosis)	Child PTG, Quality of Life, Illness perception & optimism	PTGI Item Mean score = 2.7. PTSD Checklist mean score = 31.1 PTG predicted by feeling currently affected emotionally by the past illness. No association with child growth. No relationship between PTG and PTSS

### **1.8.1.1 Levels of PTG and PTSS.**

All of the studies reported comparable rates of PTG apart from Jenewein et al. (2008) who reported lower PTG means, which may be as a result of the increased length of time since the trauma (i.e., 3-4 years). Overall, the rates reported by these studies are at the lower end of the range reported following a variety of traumatic events (Linley & Joseph, 2004). Consistent with the literature discussed in section 1.6.6.3, the studies identified here mostly reported higher rates of PTG amongst mothers compared to fathers. Reasons cited for this include, mothers being more exposed to the situation by spending more time with the child (Best et al., 2001), mothers experiencing higher levels of distress (Hungerbuehler et al., 2011; Schneider et al., 2011), the use of coping strategies compatible with the development of PTG (Pinelli, 2000; Treynor et al., 2003) and biological differences in response to stress (Tamres et al., 2002). The exceptions to this finding include the study by Barr (2011) who reported no significant difference between mothers and fathers (although the trend is in this direction) and Colville and Cream (2009) and Michel et al. (2010) where separate scores for mothers and fathers were not reported, most likely due to the small sample size of fathers (n=11; Colville & Cream, 2009) and (n=5; Michel et al., 2010).

Comparison of levels of PTSS across studies is difficult because of the different measures used. Using different self-report measures both Michel et al. (2010) and Colville and Cream (2009) reported average scores which are below cut offs for a potential diagnosis of PTSD. Finally, the study by Best et al. (2001) did not report descriptive statistics for PTG and PTSS.

### **1.8.1.2 Factors associated with PTG & PTSS.**

The studies in this review differ in the variables they investigated and few of the variables posited by Tedeschi and Calhoun (2004) within the model of PTG were explored. However, consistent with the model, cognitive appraisals such as perceived stressfulness (Barr, 2011; Spielman & Taubman-Ben-Ari, 2009), meaning in caregiving (Schneider et al., 2011), coping by positive reappraisal (Barr, 2011), pre-trauma factors such as trait anxiety (Best et al., 2001; Spielman & Taubman-Ben-Ari, 2009) and current distress (Hungerbuehler et al., 2011; Michel et al., 2010) were associated with PTG within this review. Consistent with the predictors of PTSS discussed in section 1.5.5, anxiety, depression and distress levels at the time of the event were positively related to PTSS (Best et al., 2001; Colville & Cream, 2009)

While it is difficult to generalise, the mixed findings found with regards to the relationship between PTG and PTSD; positive (Best et al., 2001), unrelated (Michel et al., 2010) and curvilinear (Colville & Cream, 2009), are consistent with the discussion in section 1.7.

A number of methodological limitations need to be considered when interpreting these findings.

## **1.8.2 Methodological issues.**

### **1.8.2.1 Design and sample size.**

Half of the studies reviewed are cross-sectional ([Jenewein et al., 2008](#); Spielman & Taubman-Ben-Ari, 2009; Michel et al., 2010; Schneider et al., 2011). This design does not allow exploration of how variables and relationships between variables may change over time. Furthermore, cause and effect relationships cannot be identified (Barker, Pistrang, &

Elliott, 2002). This design has however, enabled these studies to take a snap shot of the many variables that are hypothesised to be important in the development of PTG and PTSS in a range of populations, which is an important first step when conducting research (Barker et al., 2002).

The sample size of these studies ranged from 38 (Jenewein et al., 2008) to 273 (Schneider et al., 2011) with many studies commenting on the difficulty in gaining increased numbers of the target population. Larger sample sizes would have increased confidence in the findings of studies that explored many variables and used regression analysis (Best et al., 2001; Jenewein et al., 2008; Spielman & Taubman-Ben-Ari, 2009). Relative to other studies investigating parents of infants on the NICU, Barr (2011) has a relatively good sample of 85 mothers and 73 fathers. This is particularly given the documented difficulty in recruiting fathers within paediatric research (Phares et al., 2005). All of the studies cited attempted to recruit both mothers and fathers with varying success, with mothers making up between 50% (Jenewein et al., 2008; Spielman & Taubman-Ben-Ari, 2009) and 89% (Michel et al., 2010) of the sample sizes.

### **1.8.3. Summary and theoretical and clinical implications.**

The studies reviewed demonstrated little overlap in the variables assessed when exploring PTG and PTSS in parents of ill children or babies. This may reflect the infancy of research in this area and, therefore, the range of potentially important variables to consider. Variables found to be potentially related to PTG included cognitive appraisals such as the perceived stressfulness of the experience, psychological distress, anxiety and coping strategies such as positive reappraisal. The studies reviewed did not explicitly set out to test aspects of Tedeschi and Calhoun (2004) model of PTG although some support for aspects of this model is provided. References are made to other conceptualisations of

growth (e.g., an existential understanding of PTG; Barr, 2011). Studies would however have benefitted from making stronger and more explicit references to models of growth which may have helped focus the variables explored. Furthermore research would benefit from considering how to improve recruitment of this population to increase sample sizes. The review highlight that PTG is experienced within this population. There is, however, still a limited understanding of how the experience of PTG may relate to the experience of distress and trauma.

### **1.9 Conclusion and Rationale for Current Study**

A large percentage of babies admitted into the NICU are premature; a situation which for many parents, may be experienced as traumatic as suggested by reported rates of PTSS (Beck et al., 2010; Holditch-Davis et al., 2003; Karatzias et al., 2007; Shaw et al., 2009). PTG is also an important area of research, consistent with the ‘positive psychology’ movement, as it may support the development of a more holistic understanding of posttraumatic reactions (Seligman & Csikszentmihalyi, 2000). Studies investigating parents of premature babies have either explored PTSS (Karatzias et al., 2007) or PTG (Spielman & Taubman-Ben-Ari, 2009), none have explored both of these variables in this population. The evidence for the potential negative impact of PTSS in parents, on the developing child, suggests that exploring growth and its relationship with PTSS may be clinically useful (Bosquet Enlow et al., 2011; Forcada-Guex et al., 2011; Pierrehumbert et al., 2003).

A variety of predictors have been highlighted as important in the development of PTSS and PTG. Dekel et al. (2011) reported peritraumatic factors such as distress and coping as predictive of both PTSS and PTG while pre-trauma and personality variables were a stronger predictor of PTSS. Other variables that have been reported as potentially

predictive of PTSS and PTG include social support and rumination (Barr, 2011; Elklit et al., 2007; Helgeson et al., 2006; Holditch-Davis et al., 2003; Linley & Joseph, 2004; Singer et al., 1996; Taku et al., 2008). The model of PTG highlights the potential relationship between social support and rumination in the development of PTG. However, there is a paucity of research in the general literature, investigating this aspect of the model.

To date, there are no studies which have investigated both PTSS and PTG in parents who have had a premature baby hospitalised on a NNU. Theoretical models of PTSD (Ehlers & Clark, 2000; Wells & Sembi, 2004a, 2004b) and PTG (Tedeschi & Calhoun, 2004; Joseph et al., 2012) hypothesise the role of environmental factors such as social support and cognitive-emotional factors such as rumination in the development of trauma and growth. These models provide a framework for understanding better the experience for parents in these settings. There are no studies that have investigated rumination type in relation to PTSS and PTG within this population. Paediatric research has emphasised the importance of social support within these settings (Jones, Rowe, & Becker, 2009; Lau & Morse, 2001; Preyde & Ardal, 2003; Van Riper, 2001), therefore it is of interest how this might relate to PTG. Therefore, in addition to measures of PTG and PTSS, this study includes measures of perceived social support and intrusive and deliberate rumination. Specifically these variables are included to test aspects of the model of PTG; the existence of different types of rumination (intrusive & deliberate), how these and social support may be related to PTG and PTSS and how rumination and social support are related to each other.

The potential clinical implications of this study include, increasing awareness for both clinicians and families that parents may feel distressed but may also experience positive psychological changes (Barr, 2011). Thus facilitating a shift towards a more

holistic understanding of posttraumatic responses and normalising the variety of emotions and reactions that can be experienced by parents (Lefkowitz et al., 2010). It is also clinically valuable for the separate and joint experiences of mothers and fathers to be researched (Phares et al., 2005; Rowe & Jones, 2010). As discussed, there is evidence to suggest that mothers may experience more distress (Elklit et al., 2007; Lefkowitz et al., 2010; Pierrehumbert et al., 2003) and more growth (Buchi et al., 2009; Buchi et al., 2007; Jenewein et al., 2008; Spielman & Taubman-Ben-Ari, 2009) than fathers and the potential reasons for this are many, but not yet established. Understanding these potential differences is important when designing services and clinical interventions (Barlow et al., 2010). Evidence supportive of models of PTG within this population can support the development of clinical interventions, potentially related to the range and type of social support available, providing opportunities for emotional expression and promotion of helpful coping strategies (Joseph et al., 2012). Understanding better the potential separate and overlapping pathways to distress and growth may also lead to changes to theoretical models of distress and adjustment following trauma and adversity as well as indicating areas for change in clinical practice (Dekel et al., 2011; Joseph et al., 2012; Zoellner & Maercker, 2006).

### **1.10 Aims of the Investigation**

This thesis primarily sets out to report the existence of PTSS and PTG in parents of premature babies hospitalised on a NNU and to test the PTG model (Tedeschi & Calhoun, 2004) by examining the relationships between rumination type (intrusive & deliberate) and PTSS, PTG and social support. As secondary aims, the study investigates the relationship between PTSS and PTG and finally explores differences between mothers and fathers on the main study variables (i.e., PTSS, PTG, rumination and social support).

### **1.10.1 Research questions.**

Hypotheses were based on the empirical evidence or theoretical models predicting a relationship between the studied variables. For questions (1c, 3c, 5, 6, 7c & 7d) which are exploratory, no hypotheses were made due to there not being sufficient research evidence from which to generate hypotheses.

#### **1.10.1.1 *Primary research questions.***

1. What is the relationship between rumination type and PTSS and PTG?

Based on the literature reviewed, it was hypothesised that intrusive rumination would be positively correlated with PTSS (Hypothesis 1a) and deliberate rumination would be positively correlated with PTG (Hypothesis 1b).

1c. Is the relationship between rumination type and PTSS and PTG, different for mothers and fathers?

2. Is there a significant difference in PTG scores between parents who experience both high levels of intrusive and deliberate rumination and those who experience high levels of intrusive rumination and low levels of deliberate rumination?

Based on the PTG model, it was hypothesised that those with high deliberate rumination would experience significantly higher levels of PTG.

3. What is the relationship between social support and rumination type?

Based on the PTG model it was hypothesised that social support would be negatively correlated with intrusive rumination (Hypothesis 3a) and positively correlated with deliberate rumination (Hypothesis 3b).



3c. Is the relationship between social support and rumination type different for mothers and fathers?

4. How much does social support independently contribute to the development of deliberate rumination?

Based on the PTG model it was hypothesised that social support would be a significant predictor for the development of deliberate rumination.

#### **1.10.1.2 Secondary research questions.**

5. What is the relationship between PTG and PTSS?

5a. Is the relationship between PTG and PTSS different for mothers and fathers?

6. How much do rumination and social support contribute, in addition to PTSS, to the development of PTG?

7. Are there differences between mothers and fathers?

a. In levels of PTSS?

Based on the literature reviewed, it was hypothesised that levels of PTSS would be higher in mothers (Hypothesis 7a)

b. In levels of PTG?

Based on the literature reviewed, it was hypothesised that levels of PTG would be higher in mothers (Hypothesis 7b)

c. In levels of perceived social support?

d. In levels of intrusive and deliberate rumination?

## **2. Methodology**

### **2.1 Overview**

This chapter aims to summarise the methodology used in this study. The chapter begins with the study design, participant recruitment criteria and sample size calculation. The recruitment and testing procedure and associated response rate are then outlined. This is followed by a description of a second phase of recruitment and the reasons for this are discussed. The chapter goes on to outline the sample characteristics for the paired and unpaired data collected and summarises the measures used, reporting reliability and validity data. The ethical issues considered are then described before ending the chapter with the plan of analysis.

### **2.2 Design**

The study used a cross-sectional, correlational design to investigate the relationships between PTSS and PTG, rumination type and perceived social support. Comparison of mothers and fathers on measures of PTSS, PTG, rumination type, perceived social support and depression were also completed within this design. The independent variable in this study was gender. The dependent variables were PTSS, PTG, intrusive and deliberate rumination and perceived social support. Depression was also measured, based on the well documented comorbidity between PTSD and depression (Bleich, Koslowsky, Dolev, & Lerer, 1997; Brady, Killeen, Brewerton, & Lucerini, 2000; O'Donnell, Creamer, & Pattison, 2004). Other measures were employed to characterise the sample.

Measures were taken at one time point; 4 - 8 weeks post discharge from the NNU. This time period allowed for the investigation of PTSS and the investigation of parents' experiences at a critical time; shortly after discharge home from the NNU (Broedsgaard & Wagner, 2005; Jones et al., 2009; Miles & Holditch-Davis, 1997). The use of a

retrospective, cross-sectional design does not allow the causal nature of relationships between the studied variables to be established (Barker, Pistrang & Elliot, 2002). Given the lack of research on PTG in this population, this explorative cross-sectional study does, however, provide an initial investigation of relationships where there is a paucity of research, before investing in longitudinal studies.

## **2.3 Participants**

### **2.3.1 Inclusion and exclusion criteria.**

Birth mother-father dyads of premature babies that had survived and been hospitalised on the NNU were recruited for this study. The inclusion criteria were as follows: infants of gestational age between 29-36 weeks with birth-weight greater than 1500g, parents 18 years or over and proficiency in the English written language. The exclusion criteria were as follows: parents where the father had no contact with the mother or baby, parents with current drug or alcohol problems and mothers with on-going physical health problems as a result of the birth.

Many studies researching this population separate premature babies into 'high risk' and 'low-risk' based on gestational age and birth-weight (Ahlund et al., 2009; Elklit et al., 2007; Feeley et al., 2009; Holditch-Davis et al., 2003; Kersting et al., 2004; Lee, Lin, Huang, Hsu, & Bartlett, 2009; Moore, Taylor, Klein, Minich, & Hack, 2006; O'brien, Asay, & McCluskey-Fawcett, 1999; Rowe & Jones, 2010; Zelkowitz, Bardin, & Papageorgiou, 2007). The majority of these studies have focused on 'high-risk' babies such as those with very low birth weight (VLBW), defined as being below 1500g (UNICEF & WHO, 2004). This study, therefore, aimed to increase our understanding of the experiences of parents of 'low risk' premature babies, and used gestational age and birth-weight cut offs consistent with those for 'low-risk' babies, reported in the literature.

Given the primary aim of this study in documenting PTG and PTSS in both mothers and fathers and comparing these, only birth mother-father dyads were recruited. Mothers and fathers no longer together could take part as long as the father was still in contact with the mother and baby. Parents below 18 years old were excluded, given the potential additional development issues associated with parenting at a younger age. Physical health problems that meant parents were not invited to take part included those that kept the mother in hospital. The rationale for this, and for the exclusion of parents with current drug or alcohol problems, was to control for other factors that might have influenced the parents' responses on the questionnaires. The decision as to whether to invite parents to take part was assisted by the staff teams working with these parents.

### **2.3.2 Sample size calculation.**

The sample size required in order for this study to have enough statistical power to find an effect that is actually present was calculated using an online statistical programme G\*Power (Faul, Erdfelder, Lang, & Buchner, 2007). These calculations are summarised in Table 2, using power of .80, an alpha level of .05 and a one tailed test.

Table 2.

*Sample Size Calculations*

Hypothesis No.	Mean (SD) Mothers	Mean (SD) Fathers	Correlation between groups	Total Sample Size	Reference
1	11.9 (8.1)	8.7 (6.9)	.5	37	(Landolt, Vollrath, Ribi, Gnehm, & Sennhauser, 2003)
2	55 (24.05)	47.7 (23.34)	.5	67	(Barr, 2011)
3a	r = .60			41	(Cann, Calhoun, Tedeschi, & Solomon, 2010)
3b	r = .40			89	(Cann, Calhoun, Tedeschi, & Solomon, 2010)

To answer the primary research question, a total of 37 mother-father pairs were required for this study. The neonatal unit at the Norfolk and Norwich University Hospitals NHS Foundation Trust indicated that they saw 322 babies of gestational age between 29 and 36 weeks and birth weight greater than 1500g in 2010 (Dr. P. Clarke, personal

communication, March 18, 2011). Given the recruitment period for this study, this indicated a maximum of approximately 161 potential babies. Considering the other exclusion criteria for parents and response rates of 22 – 34% reported in similar previous studies (Ahlund et al., 2009; Shaw et al., 2009), four neonatal units were involved in recruitment; The Norfolk and Norwich University Hospital, Addenbrooke's Hospital, West Suffolk Hospital and Ipswich Hospital.

### **2.3.3 Recruitment procedure.**

Potential parents, who had been given a discharge date, were initially approached about the study, by a NNU staff member. Parents either completed a consent to share contact information form (appendix B) or gave verbal consent for the researcher to discuss the study with them. The researcher spoke to interested parents whilst they were on the NNU and provided them with a participant information sheet (PIS) (appendix C). Parents that wished to take part were asked to complete a consent form (appendix D) and provide their GP and address details. GP information was required for the researcher to check the status of the baby with the GP before sending out the questionnaire packs, 4-8 weeks following discharge. Recruitment posters were also employed and put up around the neonatal wards to advertise the study. At all sites, staff members who were key collaborators in the study assisted in approaching potential participants when the researcher was not able to be present on the ward.

## **2.4 Questionnaire Procedure**

Participants were given the option of completing the questionnaires 4-8 weeks post discharge, with the researcher present (e.g., at the participant's home or another preferred location), or independently by post. These options were discussed in detail during the

contact time with the researcher. No participants opted for the non-postal version and so this will not be described.

#### **2.4.1 Postal participation procedure.**

Participants were informed that they would receive the questionnaires in the post approximately 4 weeks after the discharge date for their baby.

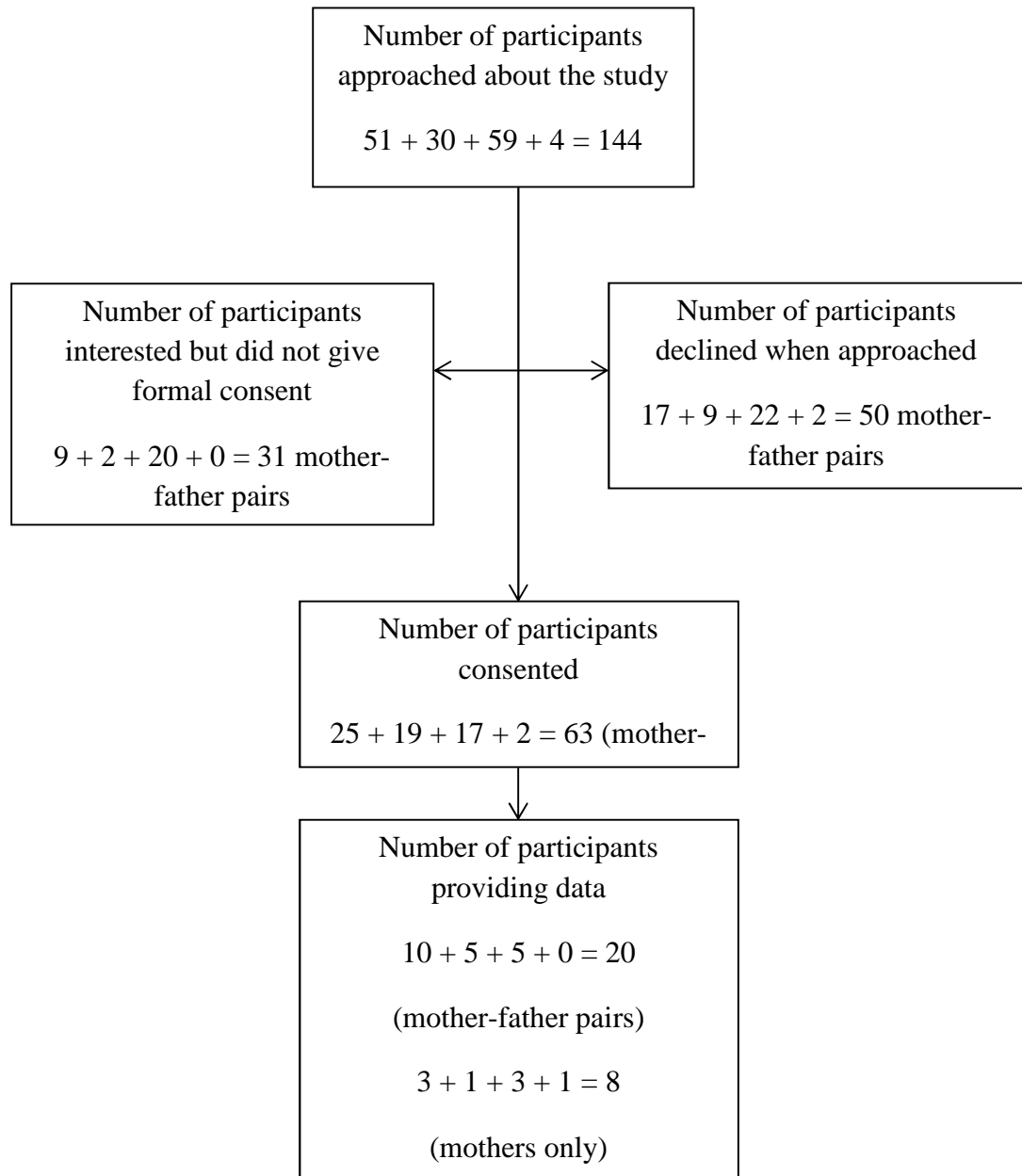
Once the researcher had received the consent form from the participant, the participant's GP was sent a letter (appendix E) and a signed copy of the participant's consent form. Approximately 3 weeks post discharge, the researcher contacted the participant's GP to check the status of the baby. With confirmation of the healthy status of the baby, the participants were sent the questionnaire packs in the post with a stamped addressed envelope enclosed for them to return the completed questionnaires to the researcher in. This pack included a covering letter (appendix F) and the PIS to ensure participants had the researcher's contact details and contact details of sources of support should they need them.

#### **2.4.2 Response rate.**

During the 6 month data collection period, a total of 144 information packs (including two copies of PISs and Consent Forms) were offered to parents between the four units. Of this number, 63 mother-father pairs formally consented to take part, with 50 mother-father pairs declining when approached and 31 mother-father pairs not giving formal consent. Of those who consented to take part, 20 mother-father pairs and 8 mothers returned their questionnaires. Therefore, the response rate was 19%, a little lower than rates reported in similar previous studies. Reminder letters (appendix G) were sent out to 42 pairs as they had not returned their questionnaires after 5 weeks. This prompted 8 pairs and 2 mothers to return questionnaire packs. Please see figure 2 for recruitment flow chart.

Figure 2

*Recruitment Flow Chart – Recruitment Phase 1*



*Note. Numbers represent Addenbrooke's, West Suffolk, N&N and Ipswich Hospitals respectively.*



### **2.4.3 Recruitment procedure – second phase.**

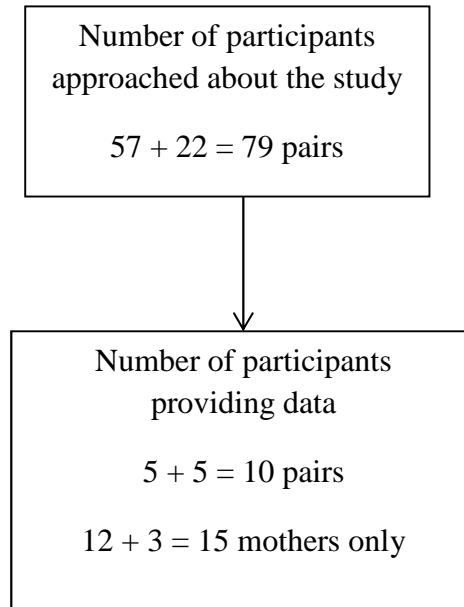
The numbers required to reach statistical power for the primary research question of this study had not been reached following 6-7 months of recruitment. The researcher therefore applied to ethics to change the recruitment procedure (appendix P) and attempt to increase participation. The amended procedure was designed to increase efficiency and reduce potential pressure on the parents to take part in the study. This procedure did not require face to face contact with parents as information packs including the questionnaires were sent to the addresses of all parents who met inclusion criteria, within one week of their baby's discharge from the hospital. The revised covering letter for this new procedure can be seen in appendix H. The PIS was also adapted to reflect this procedure change (appendix I). Consent was assumed on returning of completed questionnaires. The researcher recruited from West Suffolk Hospital and The Norfolk and Norwich Hospital using this procedure. Due to limited numbers being recruited from Ipswich Hospital, the researcher did not include this hospital in the second phase of recruitment. Unfortunately Addenbrooke's Hospital reported not having the time to dedicate to being a part of the second phase of recruitment.

### **2.4.4 Response rate – second phase.**

During the 3.5 month second recruitment phase, a total of 79 questionnaire packs were sent out to mother-father pairs. A total of 10 mother-father pairs and 15 mothers returned their questionnaires. Therefore, the response rate was 32%. In total, during 10.5 months of recruitment, 30 mother-father pairs and 23 additional mothers completed questionnaires.

Figure 3

*Recruitment Flow Chart – Recruitment Phase 2*



*Note. Numbers represent the N&N and West Suffolk Hospitals respectively.*

**2.4.5 Sample characteristics of the paired data.**

Within the paired data, the age of mothers ranged between 20 and 40 years (median = 31 years). The age of fathers ranged between 20 and 45 years (median = 31 years). The majority (93%) of mothers and fathers were White British and married (77%) with the remaining parents reporting having a partner. The majority of mothers (60%) and fathers (43%) left education after the age of 18. For 80% of fathers and 73% of mothers, this premature baby was their first child. Of the 30 parent pairs, 2 reported having twins. In terms of previous mental health difficulties, 73% of mothers and 90% of fathers reported no previous mental health diagnoses. For the mothers that did report previous mental health diagnoses, depression, postnatal depression and anxiety were reported. One father reported a previous diagnosis of depression and another a previous diagnoses of depression and anxiety.

Tables 3 and 4 outline the demographic characteristics of the premature infants.

Table 3

*Sample characteristics of childbirth variables for paired data*

		<b>N (%)</b>
<b>Gestation</b>	30 weeks	2 (6.7)
	31 weeks	1 (3.3)
	32 weeks	6 (20)
	33 weeks	6 (20)
	34 weeks	5 (16.7)
	35 weeks	6 (20)
	36 weeks	4 (13.3)
<b>Birth Weight</b>	1500 – 2000g	10 (33)
	2000 - 2500g	13 (42.9)
	2500 – 3000g	6 (19.8)
	3000 – 3500g	1 (3.3)
<b>Number of days hospitalised in NNU</b>	< 1 week	5 (16.5)
	1 -2 weeks	6 (19.8)
	2 – 3 weeks	13 (42.9)
	3 – 4 weeks	2 (6.7)
	> 4 weeks	4 (13.2)

#### **2.4.6 Sample characteristics of the unpaired mothers' data.**

Within the unpaired data, the age of mothers ranged between 21 and 49 years (median = 31.5 years). The majority (87%) of mothers were White British and married (65%) with 26% reporting having partners. One mother reported she was divorced and another that she was single. There was a more equal spread across the age at which mothers left education, compared to the paired mothers, with 32% reporting that they left at the age of 16, 23% at 18 and 41% after the age of 18. For just over half of mothers (56.5%), this premature baby was their first child, with the remaining mothers having one to three previous children. Of the 23 mothers, 5 mothers had twins and 1 had triplets. In terms of previous mental health diagnoses, 78% reported no previous mental health

diagnoses. Of the remaining mothers, previous diagnoses of depression, anxiety & PTSD were reported.

Table 4

*Sample characteristics of childbirth variables for unpaired data*

		<b>N (%)</b>
<b>Gestation</b>	30 weeks	3 (13)
	31 weeks	3 (13)
	32 weeks	2 (8.7)
	33 weeks	0 (0)
	34 weeks	6 (26.1)
	35 weeks	4 (17.4)
	36 weeks	5 (21.7)
<b>Birth Weight</b>	1500 – 2000g	11 (47.3)
	2000 - 2500g	7 (30.1)
	2500 – 3000g	4 (17.2)
	3000 – 3500g	1 (4.3)
<b>Number of days hospitalised in NNU</b>	< 1 week	6 (26.1)
	1 -2 weeks	6 (25.8)
	2 – 3 weeks	1 (4.3)
	3 – 4 weeks	3 (12.9)
	> 4 weeks	7 (30.1)

## 2.5 Measures

### 2.5.1 Demographic information.

Participant and infant information was collected using an idiosyncratic questionnaire designed for this study (appendix J). The infant information included: birth weight, gestational age, length of hospitalisation, and previous and current physical health problems. The parent information comprised of: gender, age, marital status, number of children, ethnic origin, educational level and previous mental health problems. These variables were included as they were consistent with previous research (Barr, 2011;

Sawyer & Ayers, 2009; Spielman & Taubman-Ben-Ari, 2009) to characterise the study participants and to act as control variables.

### **2.5.2 Posttraumatic Growth Inventory (PTGI).**

The Posttraumatic Growth Inventory (PTGI) (Tedeschi & Calhoun, 1996) is a measure for assessing positive outcomes following traumatic events (appendix K) and has been used in a range of previous research (Barr, 2011; Best et al., 2001; Colville & Cream, 2009; Cordova et al., 2001; Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003; Sawyer & Ayers, 2009; Snape, 1997). The scale measures five factors: New Possibilities, Relating to Others, Personal Strength, Spiritual Change and Appreciation of Life on a 5 point scale ranging from 0 (*I did not experience this change*) to 5 (*I experienced this change to a very great degree*). Higher scores indicate more growth. In this thesis, a score of 62 is reported as a moderate degree of PTG, as reported by Sawyer and Ayres (2009). The items may be adapted to a specific event and so in this study, parents were asked to rate the items in relation to their experience of having a premature baby hospitalised on the neonatal unit.

The PTGI has good internal consistency with Cronbach's  $\alpha$  reported between .9 and .95 (Barr, 2011; Sawyer & Ayers, 2009; Tedeschi & Calhoun, 1996) and good test-retest reliability of .71 over 2 months (Tedeschi & Calhoun, 1996). A recent study by Taubman-Ben-Ari, Findler, and Sharon (2011) examined the suitability of the PTGI as a measurement tool of perceived growth in mothers and supported the use of the measure for this purpose in a range of samples including mothers of premature babies.

### **2.5.3 Impact of Event Scale –Revised (IES-R).**

Posttraumatic stress symptoms were measured using the Impact of Event Scale – Revised (IES-R) (Weiss & Marmar, 1997) (appendix L). The IES-R is a 22 item, self-report measure of traumatic symptoms following any specific life event. In this study, the

event was specified as the experience of having a premature baby hospitalised on the neonatal unit. The IES-R comprises three subscales: Intrusion (8 items), Avoidance (8 items) and Hyperarousal (6 items) which parallel the DSM-IV criteria for PTSD. Each item is rated on a 5 point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*) according to the previous seven days. Creamer, Bell, and Failla (2003) reported internal reliability (Cronbach's  $\alpha = .96$ ) for the total scale as well as for the three subscales (intrusion = .94, avoidance = .87 and hyperarousal = .91). Test-retest reliability ranged between .51 and .94 (Weiss & Marmar, 1997). The scales' concurrent validity was assessed by comparing it to the PTSD Check List (PCL) (Weathers, Litz, Herman, Huska, & Keane, 1993). The IES-R total score was highly correlated with the PCL total score ( $r = .84, p < .001$ ). The IES-R has been widely used in various populations including parents of ill babies (Kersting et al., 2004).

#### **2.5.4 Event-Related Rumination Inventory (ERRI).**

The Event-Related Rumination Inventory (ERRI) was developed by Cann et al. (2011) to measure two styles of rumination, intrusive (10 items) and deliberate (10 items) (appendix M). The items are rated on a 4 point Likert scale, ranging from 0 (*not at all*) to 3 (*often*). In the absence of cut off scores reported by Cann et al. (2011), a cut off score of over 14 (>50%) is used in the analysis for both scales, when identifying higher levels of rumination. The measure aims to assess event related, transient styles in processing as opposed to stable differences in style. The validation study reports that across the three samples used the two-factor model was repeatedly supported with high internal reliability (intrusive = .94; deliberate = .88). In terms of construct validity, small but statistically significant relationships were found between the two ERRI styles and measures of stable tendencies of ruminative style. The overlap between these measures was small, suggesting that the ERRI factors are measuring something distinct from stable ruminative tendencies.

Recent studies have reported good internal consistency for both subscales (Cronbach's  $\alpha$  between .87 and .95) (Groleau, Calhoun, Cann, & Tedeschi, 2012; Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2011).

### **2.5.5 Crisis Support Scale (CSS).**

The Crisis Support Scale (CSS) (Joseph, Andrews, Williams, & Yule, 1992) (appendix N) is comprised of seven items measuring different aspects of perceived social support following a traumatic event. Items are rated on a seven point Likert scale, ranging from 0 (*never*) to 7 (*always*). One item measures overall levels of satisfaction while the other six items are summated to obtain a total crisis support score. The scale asks for ratings of support at two time points, immediately after the event and currently. In this study, the responses for immediately after the event are retrospective as the measure was only given at one time point. In the original study, Joseph et al. (1992) reported good internal reliability (Cronbach's  $\alpha = .80$ ). More recently, Elklit et al. (2001) analysed 4,213 CSS questionnaires from 11 studies investigating various traumas including injuries, illness and infant death. Overall, good internal reliability was reported (Cronbach's  $\alpha = .82$ ).

### **2.5.6 The Center for Epidemiologic Studies Depression Scale (CES-D).**

A measure of depression was used due to the high comorbidity of PTSD and depression. The Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977) (appendix O) is a 20 item scale using a 4 point Likert scale and has frequently been used in a range of populations, including mothers of premature infants (Miles, Holditch-Davis, Schwartz, & Scher, 2007). Higher scores indicate more depressive symptoms with a score of 16 and above suggesting a clinical range of symptoms. Devins et al. (1988) reported test-retest reliability of .61 over a 3 month period. The measure has shown good

internal reliability; in a study of mothers of premature infants (Cronbach  $\alpha = .87$  to  $.91$ ) (Mew, Holditch-Davis, Belyea, Miles, & Fishel, 2003) and in mothers of medically fragile infants, values of  $.88$  to  $.90$  are reported (Miles, Holditch-Davis, Burchinal, & Nelson, 1999).

## **2.6 Ethical Considerations**

### **2.6.1 Ethical approval.**

Ethical approval for this study was gained from Hertfordshire Research Ethics Committee (appendix P). Research and design approval was also sought from the relevant NHS trusts the participants were to be recruited from; these were the Norfolk and Norwich Hospital NHS Foundation Trust, Addenbrooke's Hospital NHS Foundation Trust, West Suffolk Hospital NHS Trust and Ipswich Hospital NHS Trust. Further details can be found in appendix Q.

### **2.6.2 Informed consent – original procedure.**

All parents approached to take part in the study were provided with a PIS (appendix C) detailing what the study involved, potential risks and how to take part. Before parents were able to participate in the study, the researcher met with them to discuss the study in more detail and to answer questions. The PIS outlined the parents' right to withdraw at any time, without giving a reason and this was reiterated when meeting with the parents. In order for parents to participate in the study, they were required to complete a consent form (appendix D), confirming that they understood the information provided in the PIS and agreed to take part. This consent form also confirmed that parents agreed for their GP to be informed of their participation in the study so that the researcher was able to check the status of the baby after discharge from the hospital before giving parents the



questionnaires. Consent forms were either completed during the meeting with the researcher or at a later date by the parents.

### **2.6.3 Informed consent – second procedure.**

As in the original procedure, parents received detailed information about the study within the PIS (appendix I) on which they could make an informed decision as to whether to take part. Consent was assumed through returning of completed questionnaires. Non-consent was communicated through returning of blank questionnaires.

### **2.6.4 Confidentiality and anonymity – original procedure.**

The PIS outlined to participants that all information and questionnaire data would remain anonymous and would be treated confidentially. Each participant was allocated a unique identifier number that was recorded on their consent form. This identifier number was written on the questionnaire packs. The consent forms and questionnaire packs were stored separately in locked cupboards in the researcher's home before being transferred to the University of East Anglia (UEA) for secure storage at the earliest opportunity. All electronic data from the questionnaires was stored securely and anonymously on a password protected memory stick which only the researcher and two research supervisors had access to. The contact details of those who agreed to be contacted about future research projects have been stored in a locked filing cabinet at UEA and may be stored for five years for long term follow up studies to be conducted (with appropriate ethical and research and design approval). All other data containing personal identifiable information has been destroyed on completion of the study.

### **2.6.5 Confidentiality and anonymity – second procedure.**

Using this procedure, identifier numbers were written directly onto questionnaire packs and sent from the hospital grounds. Surnames of potential participants were stored securely by the researcher, in the event of needing to return to the hospital to gain address details of participants to send risk letters or summaries of the study to.

### **2.6.6 Management of distress and risk – original procedure.**

The PIS explained to participants that there was a chance that they may become distressed when completing the questionnaires for this study. Participants were aware that the study was about their emotional experiences and that the questionnaires would be asking questions about how they were feeling, how much support they have received and any distress they have experienced. It was made clear to parents before they consented to participate that there was a chance of experiencing some distress. The PIS outlined national and local sources of support and also where to go if they had a complaint. Furthermore, these sources of support were reiterated when the researcher met with the parents. All participants were informed that if at any point during completion of the questionnaires they became distressed, they should stop completing the questionnaires. Participants were given the option of completing the questionnaires with the researcher present or independently by post and these options were discussed fully with all participants. If a participant's responses on the questionnaires indicated high levels of distress (>32 on IES-R) or low mood (>15 on CES-D), the researcher wrote a letter to the participant recommending that they contact their GP and provided contact details of sources of support. In total, 28 participants gave scores which indicated potentially clinically significant low mood or trauma symptoms, requiring letters to be written to them. This procedure was outlined to all participants in the PIS and all participants were

required to consent to their GP's being informed of their participation in the research, to take part in the study.

Participants were also required to give consent for the researcher to contact their GP to check the status of their baby before they could be given the questionnaires to complete. This was to reduce the risk of parents being contacted by the researcher when their baby had died or was seriously ill, as there was an approximate 4-8 week gap between when the participants consented to take part and when they completed the questionnaires. In addition, parents were only approached about the research study when they had a discharge date for their baby in order to reduce the risk of approaching parents when their baby was still very unwell and potentially further distressing parents.

#### **2.6.7 Management of distress and risk – second procedure.**

In the second phase of recruitment, questionnaires were sent to parents within one week of their discharge. Questionnaires were sent, following liaison with NNU staff to confirm that there had been no change in the status of the baby which would mean questionnaires should not be sent. The adapted PIS (appendix I) included the original information and contact numbers with regards to gaining support and not completing the questionnaires if participants began to feel distressed. As in the original procedure, letters were sent to participants, whose scores indicated low mood or trauma symptoms, advising them to contact their GP if they were concerned.

#### **2.6.8 Feedback.**

Participants were given the option to receive a written summary of the study findings when the research was complete. This option was outlined in the PIS and reiterated when the researcher met with the potential participants. This summary can be

seen in appendix S. The researcher also offered to feedback the findings of the study to the hospital trusts that assisted in recruiting participants for this study.

## **2.7 Plan of Analysis**

The data were analysed using the Statistical Package for Social Sciences Version 18 (SPSS). The data were checked for any missing data or outliers. The main variables were examined to determine whether they were normally distributed. The distribution for the data was assessed by examining the mothers and fathers data separately. This was done as the main analysis in this study involved comparing mothers and fathers. The significance of skewness and kurtosis was assessed by calculating z-scores. The following formula was applied (Tabachnick & Fidell, 2007):

$$z \text{ (skewness)} = S \text{ (skewness)} / Ss \text{ (standard error of skew)}$$

$$z \text{ (kurtosis)} = K \text{ (kurtosis)} / Sk \text{ (standard error of kurtosis)}$$

It is recommended that for studies with small samples a .01 significance level should be used to evaluate the significance of skewness and kurtosis (Tabachnick & Fidell, 2007). Therefore, z-scores for skewness and kurtosis, greater than 2.58 and lower than -2.58 were considered significant at the .01 level. The data's distribution was investigated visually using histograms and the Kolmogorov-Smirnov test was also computed to further assess the significance of any deviations within the distribution. Descriptive analysis of the demographic data and measures was completed, reporting means, standard deviations and internal consistency of the measures. Analysis of the relationships between the main variables (PTSS & PTG) and the demographic variables was completed using correlational analyses.

To answer research questions 1a and 1b, one-tailed correlational analyses between PTSS, PTG and rumination type (intrusive and deliberate) were conducted. The

correlations were conducted separately by gender to answer question 1c. To answer research question 2, an independent t-test comparing PTG means was conducted.

To answer research question 3a and 3b, one-tailed correlational analyses between social support and rumination type (intrusive and deliberate) were conducted. The correlations were conducted separately by gender to answer question 3c. A further regression analysis tested for the potential additional variance explained by social support on deliberate rumination, answering research question 4. To answer research question 5, two-tailed correlational analyses were conducted between PTSS and PTG, (separated by gender for question 5a) and further regression analysis applied to test between a linear and quadratic relationship. Research question 6 was answered by conducting a further regression analysis testing for the potential additional variance explained by deliberate rumination on PTG.

To answer research questions 7a and 7b, related one-tailed t-tests were calculated using IES-R means (1) and PTGI means (2) comparing paired mothers and fathers. Questions 7c and 7d were answered using related two-tailed t-tests, using CSS-Total score means (5c) and ERRI means (5d) comparing mothers and fathers.

To further characterise the sample, a description of the correlational relationship between depression and the other main variables is provided, as well as a comparison between mothers and fathers using a related two-tailed t-test. Depression was not controlled for in this thesis because of research reporting the large overlap between depressive and posttraumatic stress symptoms (Moser, Hajcak, Simons, & Foa, 2007; Thabet, Abed, & Vostanis, 2004). The correlational relationship between social support and the main variables of PTSS and PTG are also reported.

For research questions comparing mothers and fathers, only the paired data were used in the analysis given the related nature of the analysis.

### **3. Results**

#### **3.1 Overview**

In this chapter, an account of the data screening process is given. This is followed by descriptive analyses of the study's variables. The third section shows the results of the analyses used to test the primary and secondary research questions. The chapter finishes with a summary of the results.

#### **3.2 Data Screening**

##### **3.2.1 Examination of the distribution of the main variables.**

For a more detailed description of the data screening process, see section 2.7, titled Plan of Analysis. For each variable the level of skewness and kurtosis were inspected to assess their distribution. The skewness and kurtosis for each variable are presented in appendix T. Histograms were used to visually examine the distribution of data (appendix U) and Kolmogorov-Smirnov tests were used to further assess the significance of any deviations within the distribution. See section 3.3 for details of the distribution for the main variables.

##### **3.2.2 Identifying outliers.**

Box plots generated were checked for outliers. There were 5 cases of outlying values, falling outside of the top quartile. Following checks for errors, these were not removed as they represented true responses of the participants.

##### **3.2.3 Missing Data**

Missing data were randomly distributed among the variables. Overall, 0.4% of data were missing from the paired data set and 2% were missing from the unpaired data. Missing data were replaced with the mean score of the particular item across the sample, which is one of the techniques proposed by Tabachnick and Fidell (2007).

### **3.3 Descriptive Analysis of the Study's Main Variables**

This section presents descriptive data for each measure used in the main analyses.

The mean, standard deviation, minimum and maximum scores on all variables are presented in Table 5 for mothers and fathers. Cronbach's alpha ( $\alpha$ ) was calculated for each of the measures to assess internal consistency.

Table 5

*Descriptive data for main outcome variables for all samples*

	Mothers			Fathers		
	Mean (SD)	Min	Max	Mean (SD)	Min	Max
IES-R Total	15.23 (15.52)	0	71	10.79 (12.98)	0	45
IES-R - Intrusions	6.60 (6.31)	0	27	5.10 (5.93)	0	21
IES-R - Avoidance	5.22 (6.15)	0	26	3.00 (4.26)	0	15
IES-R - Hyperarousal	3.41 (4.65)	0	18	2.70 (3.67)	0	13
PTGI Total	51.51 (23.23)	3	93	42.10 (23.75)	0	91
PTGI - Others	20.11 (8.15)	0	33	15.22 (8.84)	0	33
PTGI – New Possibilities	8.77 (6.29)	0	20	7.93 (6.70)	0	24
PTGI – Personal Strength	10.98 (4.88)	1	20	8.97 (6.03)	0	19
PTGI – Spiritual Change	2.34 (3.12)	0	10	1.37 (2.71)	0	10
PTGI – Appreciation of Life	9.32 (4.40)	0	15	8.63 (4.27)	0	15
ERRI- Intrusive Rumination	12.89 (9.37)	0	30	7.63 (7.91)	0	24
ERRI – Deliberate Rumination	11.87 (8.47)	0	30	7.20 (6.72)	0	22
CSS - Social Support Total	64.32 (11.74)	30.89	84	65.46 (10.04)	39	82
CES-D Total	11.95 (9.57)	1	37	7.72 (10.25)	0	45.59



### **3.3.1 Posttraumatic symptoms: The Impact of Event Scale-Revised (IES-R).**

The Cronbach's alpha value for the IES-R was .95, indicating good internal consistency. Table 5 presents the mean, standard deviation, minimum and maximum of the scores on this scale and its three subscales. The distribution of the IES-R for both mothers ( $D(53) = .18, p < .01$ ) and fathers ( $D(30) = .25, p < .01$ ) were significantly non-normal. The positively skewed data indicates that a large proportion of parents reported low PTSS. Creamer et al. (2003) suggest that the cut off score of 33 provides maximum diagnostic accuracy for PTSD. 10 mothers (18.9%) and 1 father (3.3 %) scored above that cut off point and therefore met the screening criteria for PTSD.

### **3.3.2 Posttraumatic growth: Posttraumatic Growth Inventory (PTGI).**

The Cronbach's alpha value for the PTGI was .94, indicating good internal consistency. Table 5 presents the mean, standard deviation, minimum and maximum of the scores on this scale and its five subscales. Normal distribution of scores on the PTGI suggest that participants exhibited varied levels of PTG. Twelve mothers (22.7%) and 5 fathers (16.7%) indicated moderate degrees of PTG ( $>62$  on the PTGI). The mean scores on the PTGI were similar to those reported by Barr (2011) who studied parents of babies hospitalised on the NICU.

### **3.3.3 Rumination type: Event Related Rumination Inventory (ERRI).**

The Cronbach's alpha value for the ERRI Intrusive scale was .95 and .94 for the ERRI Deliberate scale, indicating good internal consistency. Table 5 presents the mean, standard deviation, minimum and maximum of the scores on the two subscales. The distribution of the ERRI-Intrusive subscale for both mothers ( $D(53) = .13, p < .05$ ) and

fathers ( $D(30) = .19, p < .05$ ) were significantly non-normal. The z-scores do not, however, indicate significant skewness or kurtosis for this data. The mean scores for both intrusive and deliberate rumination are lower than that reported by Triplett et al. (2011) investigating a student population. They are much higher, however, than those reported by Groleau et al. (2012) who also examined a student population. Twenty-four mothers (45.3%) and 7 fathers (23.3%) scored 50% or more ( $>14$ ) on the intrusive subscale of the ERRI. For deliberate rumination, 19 mothers (35.8%) and 5 fathers (16.7%) scored  $>14$ .

#### **3.3.4 Perceived social support: Crisis Support Scale (CSS).**

The Cronbach's alpha value for the CSS was .80 indicating acceptable internal consistency. Table 5 presents the mean, standard deviation, minimum and maximum of the scores on this scale. The mean scores for the perceived support shortly after the birth and at the time of the study were similar to those reported by Elklit et al. (2007), indicating generally high levels of perceived support.

#### **3.3.5 Depression: Center for Epidemiologic Studies Depression Scale (CES-D).**

The Cronbach's alpha value for the CES-D was .92 indicating good internal consistency. Table 5 presents the mean, standard deviation, minimum and maximum of the scores on this scale. The distribution of the CES-D for mothers ( $D(53) = .17, p < .01$ ) and fathers ( $D(30) = .23, p < .01$ ) were significantly non-normal, with scores positively skewed indicating that a significant proportion of parents reported relatively low levels of depression. A cut off score of  $>15$  is suggested by Radloff (1977) to indicate depression. The mean scores on the CES-D and percentage of parents scoring within the possible range for depression, are similar to those reported by Miles et al. (2007). Fifteen mothers (28.3%) and 2 fathers (6.7%) scored within the clinical range for depression on this screen.

### **3.4 Testing the Hypotheses and Exploring the Research Questions**

Scatterplots were created to examine the relationships between the studied variables (appendix V). Due to some of the main outcome variables being non-normally distributed, attempts were made to transform the data using log transformations. However, this was not successful. Given the high numbers of zero scores it was also decided that it would be more meaningful to use non-parametric tests, rather than attempting to transform large numbers of zero scores for a small sample size. Non-parametric Wilcoxon Signed Rank tests and Spearmans Rho correlational analysis were, therefore, carried out. Dependent tests were used given recruitment of mother-father pairs who both have the same child, meaning that their experience is not fully independent of each other.

Analyses of the relationship between the main variables and the demographic variables are described, before the results of the study's research questions are presented.

#### **3.4.1 Analysis of relationship between demographic and main variables.**

Analysis of demographic parent and child variables revealed some significant associations with the main variables of PTSS and PTG. Examination of the mothers data ( $n = 53$ ) showed that gestation was significantly negatively correlated with PTSS total score ( $r = -.337, p < .05$ ), and PTSS subscales of intrusions ( $r = -.360, p < .01$ ) and hyperarousal ( $r = -.296, p < .05$ ). The number of days the baby was hospitalised was significantly positively correlated with PTSS total score ( $r = .284, p < .05$ ), and PTSS subscales of intrusions ( $r = .313, p < .05$ ) and hyperarousal ( $r = .279, p < .05$ ).

For fathers ( $n = 30$ ), gestation was also significantly negatively correlated with PTSS total score ( $r = -.422, p < .05$ ) and the PTSS subscale of intrusions ( $r = -.466, p < .01$ ) but not hyperarousal as for mothers. The number of days hospitalised was positively

correlated with the PTSS subscale of intrusions for fathers ( $r=.389, p<.05$ ) but not with PTSS total score or hyperarousal as for mothers.

With regards to PTG, for the mothers' data ( $n = 53$ ), there was a significant negative correlation between PTG total scores for age of parent ( $r=-.516, p<.01$ ). Age of parent was also significantly negatively correlated with all PTG subscales, excluding spirituality. See appendix W for the subscale correlation coefficients. The PTG subscale of appreciation of life was significantly negatively correlated with gestation ( $r=-.343, p<.05$ ) and birth weight ( $r=-.274, p<.05$ ) and significantly positively correlated with the number of days hospitalised ( $r=.322, p<.05$ ). There were no significant correlations between PTG and the main demographic variables for fathers.

### **3.4.2 Primary research questions.**

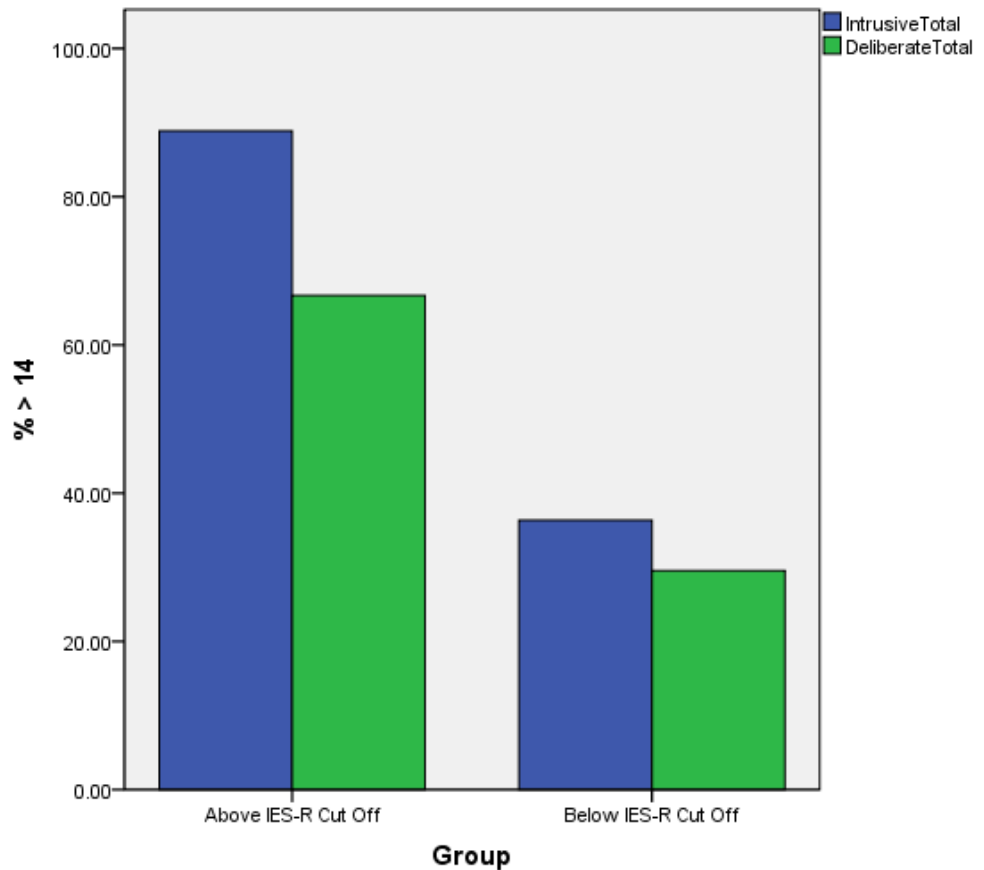
#### **3.4.2.1 Question 1. Relationship between rumination type and PTSS and PTG.**

It was hypothesised that intrusive rumination would be positively correlated with PTSS (Hypothesis 1a) and deliberate rumination would be positively correlated with PTG (Hypothesis 1b). One-tailed Spearman's correlations were used to test these relationships. Table 6 presents the correlation coefficients obtained in the analysis. All correlations were significant in the direction predicted. Therefore, Hypotheses 1a and 1b were confirmed.

Figure 4 presents a graph of the differences between mothers who scored in the clinically significant range on the IES-R and those who scored below this cut off, in terms of levels of rumination. Fathers were not included due to the low prevalence of clinically significant rates of PTSS. This graphic representation is consistent with the findings of Hypotheses 1a.

Figure 4

*Graphical representation of rumination patterns for mothers (n =53), grouped by scores above or below the clinically significant cut off point of the IES-R.*



**3.4.2.2 Question 1c. Is the relationship between rumination type and PTSS and PTG, different for mothers and fathers?**

Table 7 and 8 presents the correlation coefficients obtained when analysed separately for mothers (n = 53) and fathers (n = 30), respectively. All correlations remained significant in the direction predicted. See appendix X for correlation coefficients for PTGI and IES-R subscales for research question 1c.

Table 6

*Correlation Coefficients for Hypotheses 1, 3 & 5 -All Data (n = 83)*

Scale	1. PTGI Total	2. IES-R Total	3. ERRI- Intrusive	4. ERRI - Deliberate
1. PTGI Total				
2. IES-R Total	.384**			
3. ERRI- Intrusive	.435**	.615**		
4. ERRI- Deliberate	.605**	.633**		
5. CSS Total			-.226*	-.296**

\* $p < .05$ ; \*\*  $p < .01$

*Italics* = two-tailed test

Table 7

*Correlation Coefficients for Hypotheses 1, 3 & 5 – Mothers' Data (n =53)*

Scale	5. PTGI Total	6. IES-R Total	7. ERRI- Intrusive	8. ERRI - Deliberate
6. PTGI Total				
7. IES-R Total	<i>.381**</i>			
8. ERRI- Intrusive	<i>.427**</i>	<i>.626**</i>		
9. ERRI- Deliberate	<i>.603**</i>	<i>.639**</i>		
10. CSS Total			-.208	-.250*

\* $p < .05$ ; \*\*  $p < .01$

*Italics* = two-tailed test

Table 8

*Correlation Coefficients for Hypotheses 1, 3 & 5– Fathers' Data (n = 30)*

Scale	1. PTGI Total	2. IES-R Total	3. ERRI- Intrusive	4. ERRI - Deliberate
1. PTGI Total				
2. IES-R Total	.285			
3. ERRI- Intrusive	.396*	.605**		
4. ERRI- Deliberate	.515**	.606**		
5. CSS Total			-.316*	-.470**

\* $p < .05$ ; \*\*  $p < .01$

*Italics* = two-tailed test

#### **3.4.2.3 Question 2. Comparison of PTG scores for high deliberate rumination versus low deliberate rumination.**

To further explore the influence of deliberate rumination on PTG, a Kolmogorov-Smirnov Test was conducted. This compared PTG levels in parents with high levels of intrusive rumination ( $>14$ ) and low levels of deliberate rumination ( $<15$ ), labelled the high-low group ( $n = 15$ ); with parents with high levels of intrusive rumination ( $>14$ ) and high levels of deliberate rumination ( $>14$ ), labelled the high-high group ( $n = 16$ ). PTG levels in the high-high group ( $Mdn = 74.50$ ) were significantly higher than those in the high-low



group ( $Mdn = 49.00$ ),  $Z = 1.54$ ,  $p < 0.05$ . This highlights the potentially significant role deliberate rumination has in the development of PTG.

#### **3.4.2.4 Question 3. Relationship between social support and rumination type**

It was hypothesised that social support would be negatively correlated with intrusive rumination (Hypothesis 3a) and would be positively correlated with deliberate rumination (Hypothesis 3b). One-tailed Spearman's correlations were used to test these relationships. Table 6 presents correlation coefficients obtained in the analysis.

Hypothesis 3a was confirmed. Hypothesis 3b was not confirmed as social support was found to be significantly negatively correlated with deliberate rumination, as opposed to positively correlated, as predicted.

#### **3.4.2.5 Question 3c. Is the relationship between social support and rumination type, different for mothers and fathers?**

Table 7 and 8 present the correlation coefficients obtained for mothers ( $n = 53$ ) and fathers ( $n = 30$ ) respectively. A significant negative correlation between social support and deliberate rumination was found for both mothers and fathers. The negative correlation between social support and intrusive rumination was not significant for the mothers' data ( $n = 53$ ) however.

#### **3.4.2.6 Question 4. How important is social support in the development of deliberate rumination?**

Despite hypothesis 3b not being confirmed, a significant relationship was found, therefore, research question 4 was still considered appropriate to answer. Table 9 outlines the predictors entered into the regression model ( $n = 83$ ).

Table 9

*Linear model of predictors of deliberate rumination, with 95% bias corrected and accelerated confidence intervals reported in parentheses. Confidence intervals and standard errors based on 1000 bootstrap samples ( $n = 83$ )*

	<b>b</b>	<b>SE B</b>	<b><math>\beta</math></b>	<b>p</b>
<b>Step 1</b>				
<b>Constant</b>	16.55 (11.77, 21.54)	2.63		$p = .001$
<b>Gender</b>	-4.67 (-7.95, -1.52)	1.68	-.28	$p = .005$
<b>Step 2</b>				
<b>Constant</b>	10.13 (5.99, 14.28)	2.11		$p = .001$
<b>Gender</b>	-3.22 (-6.01, -0.62)	1.35	-.19	$p = .023$
<b>IESRTotal</b>	0.33 (0.24, 0.42)	0.45	.59	$p = .001$
<b>Step 3</b>				
<b>Constant</b>	10.13 (0.55, 19.92)	4.78		$p = .026$
<b>Gender</b>	-1.75 (-4.29, 0.66)	1.26	-.10	$p = .166$
<b>IESRTotal</b>	0.16 (0.03, 0.30)	0.06	.29	$p = .017$
<b>IntrusiveTotal</b>	0.40 (0.21, 0.59)	0.10	.45	$p = .001$
<b>SupportTotal</b>	-0.07 (-0.19, 0.06)	0.06	-.09	$p = .340$

Note.  $R^2 = .08$  for Step 1;  $\Delta R^2 = .34$  for Step 2 ( $ps < .001$ );  $\Delta R^2 = .13$  for Step 3 ( $ps < .001$ ).

The regression model indicates that social support does not explain independent variance in deliberate rumination. Intrusive rumination and PTSS appear to be more important predictors of deliberate rumination. Intrusive rumination ( $F_{\text{change}} = 11.03, p < .01$ ) predicted 13% of the variance in deliberate rumination scores and PTSS ( $F_{\text{change}} = 46.62, p < .01$ ) predicted 34% of the variance.

### **3.4.3 Secondary research questions.**

#### **3.4.3.1 Question 5. *Relationship between PTG and PTSS.***

Two-tailed Spearman's correlations were used to examine this relationship. Table 6 presents the correlation coefficients obtained in the analysis. PTG and PTSS were significantly positively correlated.

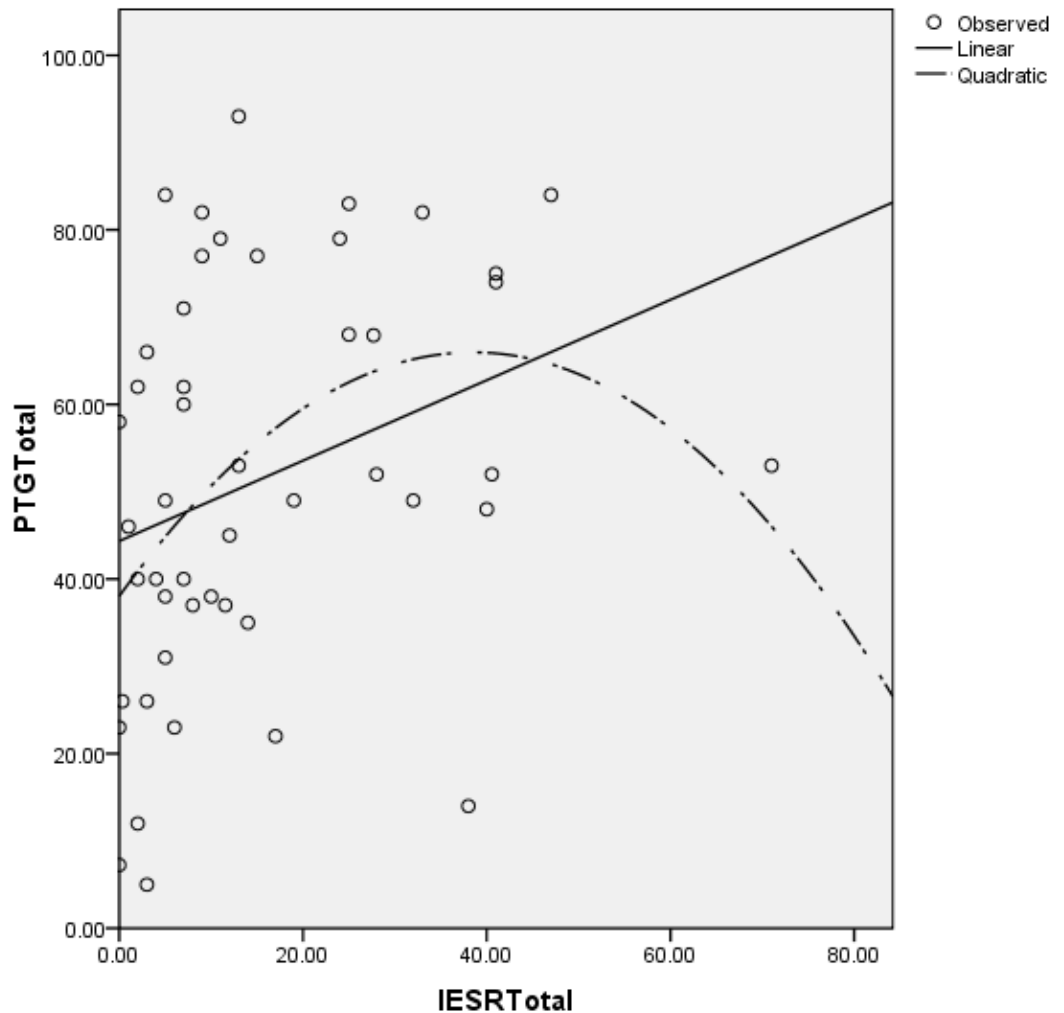
#### **3.4.3.2 Question 5a. *Is there a difference in the relationship between mothers and fathers?***

Two-tailed Spearman's correlations were again used to examine this relationship for both mothers and fathers. Table 7 and 8 presents the correlation coefficients obtained in the analyses. PTG and PTSS were significantly positively correlated for mothers but not for fathers. See appendix Y for correlation coefficients for PTGI and IES-R subscales for research question 5a.

Regression analysis was used to assess whether a linear or quadratic relationship fitted the mothers' data best. A linear solution was significant [ $R^2 = .09, F(1, 46) = 5.05, P = .029$ ] whilst the quadratic solution just failed to reach significance [ $R^2 = .17, F(2, 45) = 4.58, P = .058$ ] (see Figure 5)

Figure 5

*Relationship between PTSS and PTG for mothers*



**3.4.3.3 Question 6. How important are other PTG model variables as predictors of PTG?**

A regression analysis was conducted to answer this research question. Please see Table 10. The variables of gender, PTSS and intrusive and deliberate rumination were entered into the model. Social support was not added as a predictor to the model due to the non-significant correlation with PTG (see appendix W) and the need to keep the number of predictors to a minimum due to the relatively small sample size used ( $n = 83$ ).

The model indicates that deliberate rumination ( $F_{\text{change}} = 13.31, p < .01$ ) predicted an additional 22% to the variance in PTG scores. PTSS was quite highly correlated with both intrusive rumination (.614) and deliberate rumination (.617) which may explain the loss of the effect of PTSS once rumination was added to the model.

Table 10

*Linear model of predictors of PTG, with 95% bias corrected and accelerated confidence intervals reported in parentheses.*

	<b>b</b>	<b>SE B</b>	<b><math>\beta</math></b>	<b>p</b>
<b>Step 1</b>				
<b>Constant</b>	60.93 (45.56, 76.29)	7.73		$p = .000$
<b>Gender</b>	-9.41 (-20.06, 1.23)	5.35	-.19	$p = .082$
<b>Step 2</b>				
<b>Constant</b>	50.94 (34.84, 67.03)	8.09		$p = .000$
<b>Gender</b>	-7.16 (-17.43, 3.11)	5.16	-.15	$p = .169$
<b>IESRTotal</b>	0.51 (0.17, 0.85)	0.17	.32	$p = .004$
<b>Step 3</b>				
<b>Constant</b>	31.87 (15.66, 48.07)	8.14		$p = .000$
<b>Gender</b>	-1.06 (-10.41, 8.29)	4.70	-.02	$p = .822$
<b>IESRTotal</b>	-0.11 (-0.50, 0.29)	0.20	-.07	$p = .583$
<b>IntrusiveTotal</b>	0.19 (-0.50, 0.88)	0.35	.07	$p = .587$
<b>DeliberateTotal</b>	1.68 (0.90, 2.46)	0.39	.58	$p = .000$

Note.  $R^2 = .04$  for Step 1;  $\Delta R^2 = .10$  for Step 2 ( $ps < .05$ );  $\Delta R^2 = .22$  for Step 3 ( $ps < .001$ ).

#### **3.4.4. Question 7. Differences between mothers and fathers.**

##### **3.4.4.1 Question 7a. PTSS in mothers and fathers.**

It was hypothesised that levels of PTSS would be higher in mothers. A one-tailed Wilcoxon Signed Rank Test was used to examine the difference between paired mothers' ( $n = 30$ ) and fathers' ( $n = 30$ ) total scores on the IES-R. Mothers reported significantly higher levels of PTSS ( $Mdn = 9.50$ ) than fathers ( $Mdn = 4.50$ ),  $z = -1.994$ ,  $p < .05$ , with a medium effect size ( $r = -.30$ ). See Table 11. Therefore Hypothesis 7a was confirmed.

##### **3.4.4.2 Question 7b. PTG in mothers and fathers.**

It was hypothesised that levels of PTG would be higher in mothers. A one-way Wilcoxon Signed Rank Test was used to examine the difference between paired mothers' ( $n = 30$ ) and fathers' ( $n = 30$ ) total scores on the PTGI. Mothers reported significantly higher levels of PTG ( $Mdn = 52.50$ ) than fathers ( $Mdn = 41.00$ ),  $z = -2.109$ ,  $p < .05$ , with a medium effect size ( $r = -.27$ ). See Table 11. Therefore Hypothesis 7b was confirmed.

##### **3.4.4.3 Question 7c: Levels of perceived social support.**

A two-tailed Wilcoxon Signed Rank test was used to examine the difference between paired mothers ( $n = 30$ ) and fathers ( $n = 30$ ) on perceived social support. Mothers ( $Mdn = 66.00$ ) and fathers ( $Mdn = 67.50$ ) did not differ significantly on levels of perceived social support,  $z = -.103$ ,  $p = .918$ . See Table 11.

##### **3.4.4.4 Question 7d: Levels of intrusive and deliberate rumination.**

A two-tailed Wilcoxon Signed Rank test was used to examine the difference between paired mothers ( $n = 30$ ) and fathers ( $n = 30$ ) on levels of intrusive and deliberate rumination. Mothers reported significantly higher levels of intrusive rumination ( $Mdn =$

14.00) than fathers ( $Mdn = 5.50$ ),  $z = -3.566$ ,  $p < .001$ , with a large effect size ( $r = .46$ ). Mothers also reported significantly higher levels of deliberate rumination ( $Mdn = 13.00$ ) than fathers ( $Mdn = 6.00$ ),  $z = -2.695$ ,  $p < .01$ , with a medium effect size ( $r = -.35$ ). See Table 11.

Table 11

*Gender differences*

<b>Variable</b>	<b>Mothers (n=30)</b>	<b>Fathers (n=30)</b>	<b>Test Statistic</b>	<b><i>p</i></b>
<b>(Measure)</b>	<b>Median Score</b>	<b>Median Score</b>	<b>(z)</b>	
<b>PTSS (IES-R)</b>	9.50	4.50	-1.994	.023
<b>PTG (PTGI)</b>	52.50	41.00	-2.109	.018
<b>Social Support</b>	66.00	67.50	-1.03	.918
<b>(CSS)</b>				
<b>Intrusive</b>	14.00	5.50	-3.566	.000
<b>Rumination</b>				
<b>(ERRI-I)</b>				
<b>Deliberate</b>	13.00	6.00	-2.695	.007
<b>Rumination</b>				
<b>(ERRI-D)</b>				
<b>Depression</b>	8.00	4.50	-2.805	.005
<b>(CES-D)</b>				

*Note. Italics = one-tailed test*



### **3.4.5 Other results – depression.**

Mothers reported significantly higher levels of depressive symptoms ( $Mdn = 8.0$ ) than fathers ( $Mdn = 4.5$ ),  $z = -2.805$ ,  $p = .01$ . For mothers, depression was significantly positively correlated with total PTG, the PTG subscales of new possibilities and appreciation of life, total PTSS and all PTSS subscales as well as intrusive and deliberate rumination. Depression was also significantly negatively correlated with social support. Gestation was also negatively associated with depression for mothers. See appendix W for correlation coefficients.

For fathers, depression was significantly positively correlated with total PTG, the PTG subscales of strength and appreciation of life, total PTSS and the PTSS subscales of avoidance and hyperarousal, and in comparison to mothers, deliberate rumination only. There were no significant correlations between depression with social support or with demographic variables for fathers. See appendix W for correlation coefficients. These findings are discussed in more detail in 4.3.8.

### **3.4.6 Other results – social support.**

Correlational analysis demonstrated significant positive correlations between total scores on the CSS and the IES-R total and IES-R subscales of avoidance and hyperarousal for mothers. This is in contrast to fathers where there were no significant correlations with the IES-R, but interestingly the trend is in a negative direction, compared to mothers. In terms of PTG, there were no significant correlations between the CSS and the PTGI for mothers, with the trend in a positive direction. Fathers demonstrated a negative trend although not reaching significance. See appendix W for correlation coefficients. These findings are discussed further in section 4.3.8.

### **3.5 Summary of the Results**

It is important to acknowledge that the sample in this study was small which resulted in the study being underpowered. Lack of power cannot be ruled out when reporting non-significant relationships. As discussed by Field (2005), however, the use of non-parametric tests does not necessarily mean that a Type II error is more likely to be made (i.e., reporting a non-significant result when in fact a significant difference exists). This is because the data are not normally distributed and, therefore, the power and chances of making a Type I error cannot be calculated.

#### **3.5.1 Primary research questions.**

Hypothesis 1a and 1b were confirmed. Intrusive rumination was significantly positively correlated with PTSS and deliberate rumination was significantly positively correlated with PTG for both mothers and fathers. The analysis also showed that there were significant positive correlations between intrusive rumination and PTG and deliberate rumination and PTSD.

Question 2 highlighted that parents with high levels of deliberate rumination had significantly higher scores on the PTGI than parents with low deliberate rumination.

Hypothesis 3a was confirmed. Social support was significantly negatively correlated with intrusive rumination. Hypothesis 3b, however, was not confirmed. Social support was found to be significantly negatively correlated with deliberate rumination, not positively correlated.

The regression analysis for question 4 suggested that social support was not a significant independent predictor of deliberate rumination with intrusive rumination and PTSS found to be stronger predictors.

### **3.5.2 Secondary research questions.**

Question 5, asked about the type of relationship between PTG and PTSS. The analysis indicated a significant positive correlation. When analysed by gender, the significant positive relationship remained for mothers but not for fathers. A quadratic or curvilinear relationship was not found using the mothers' data. Such findings should be tentatively interpreted due to the small sample size involved.

Question 6 asked about the potential other important predictors in the development of PTG. Deliberate rumination was found to be the most important predictor.

Hypotheses 7a and 7b were confirmed. Mothers reported significantly higher rates of PTSS and PTG than fathers.

There was no evidence for a significant difference between reported levels of perceived social support between mothers and fathers (question 7c). For question 7d mothers reported significantly higher levels of intrusive and deliberate rumination than fathers.

## **4. Discussion**

### **4.1 Overview**

The Discussion begins with a restatement of the study's research questions and aims. This is followed by a discussion of the primary and secondary findings of the study within the context of current research and theories. The study's methodological limitations and strengths are also discussed with consideration of what could be done differently in future research studies. The theoretical and clinical implications of the study's findings are considered and to conclude the discussion, potential directions for further research are proposed and some final conclusions made.

### **4.2 Summary of Research Questions**

The study set out, foremost, to investigate levels of PTSS and PTG in parents of premature babies hospitalised on a NNU and to test the model of PTG by Tedeschi and Calhoun (2004). The study proposed to explore the role of social support and rumination type (deliberate vs. intrusive) on PTG and PTSS. In addition, this study wished to explore the relationship between PTSS and PTG in this population, prompted by mixed findings reported by other studies investigating a range of populations.

### **4.3 Summary of the Findings**

In this study, parents who had babies born earlier and needed to be hospitalised for longer experienced higher levels of PTSS, suggesting that the more premature the birth and the longer the length of hospitalisation, the more traumatic the experience. This finding is in contrast to other studies that have found no association between PTSS and these infant factors (Lefkowitz et al., 2010; Shaw et al., 2009). For mothers but not fathers, these

factors were associated with hyperarousal. This may indicate a difference in the process or experience of traumatisation between mothers and fathers.

This study also demonstrated that for mothers only, increased scores on the subscale appreciation of life was associated with lower gestation, lower birth weight and an increased stay in hospital. This highlights the significance of this concept for mothers who have a premature baby hospitalised and suggests that this aspect of growth may be particularly related to increased distress related to earlier birth and increased time hospitalised. This is consistent with the PTG subscale of appreciation of life having the strongest correlation with PTSS of all the PTG subscales. Younger mothers also reported significantly higher levels of PTG. This finding is in contrast to Vishnevsky et al. (2010), but consistent with Sawyer and Ayers (2009), who speculated that older women may report less growth because they are in a life stage where developmental change is less rapid, or may be coping with events that hinder growth. The reasons for this association with age are unclear and require further research. It is also unclear why this association was found in mothers but not fathers.

#### **4.3.1. Question 1: Relationship between rumination type and PTSS and PTG.**

Both intrusive and deliberate rumination were found to be significantly positively correlated with PTSS and PTG for both mothers and fathers. This provides further support for the model of PTG (Tedeschi & Calhoun, 2004) and the role of rumination in trauma and growth pathways reported by other studies (Cann, Calhoun, Tedeschi, & Solomon, 2010; Joseph, 2000; Nightingale et al., 2010; Siegle et al., 2004; Stockton et al., 2011; Taku et al., 2008). The correlational nature of the analysis does not allow conclusions with regards to causal relationships to be established but does provide supportive evidence that these variables are related. Interestingly, deliberate rumination and PTSS were the most

strongly correlated, consistent with the findings of Nightingale et al. (2010), with intrusive rumination and PTG showing the weakest correlation. The large relationship between deliberate rumination and PTSS may be evidence for an ‘illusory’ or self-deceptive side of growth (Maercker & Zoellner, 2004). On the other hand, the medium to large correlations for all of these relationships and the strong correlation between deliberate and intrusive rumination, may suggest shared pathways in the development of trauma and growth symptoms, and, therefore, support for the model of PTG’s assertion that some level of distress is required for growth.

#### **4.3.2 Question 2: Comparison of high deliberate rumination versus low deliberate rumination.**

Those parents who reported high levels of both intrusive and deliberate rumination reported significantly higher levels of PTG compared to parents with high intrusive rumination but low deliberate rumination. This indicates that deliberate rumination is in some way implicated in the development of PTG which is supportive of the PTG model (Tedeschi & Calhoun, 2004). This will be explored further in 4.3.6.

These findings should be interpreted with caution, given the small number of participants included in the analysis. It should be noted, however, that the Kolmogorov-Smirnov Z Test was used due to its increased power with sample sizes below 25 per group (Field, 2013).

#### **4.3.3. Question 3: Relationship between social support and rumination type.**

This thesis found that reported perceived social support was significantly negatively correlated with deliberate rumination for both mothers and fathers. In other words, the lower reported levels of social support, the higher reported levels of deliberate

rumination. It may be that the relatively high levels of social support reported in this study, reduced the need to engage in a deliberate process of meaning making. In other words, lack of social support may facilitate a more proactive search for meaning. This finding does not appear to be consistent with what is suggested by the model of PTG, where social support is hypothesised to moderate the relationship between intrusive and deliberate rumination (Tedeschi & Calhoun; 2004). Section 4.3.4 will explore this question further.

#### **4.3.4. Question 4: How important is social support in the development of deliberate rumination?**

The findings from question 4, suggest that, when controlling for gender, social support does not play a significant role in the development of deliberate rumination. This does not support the PTG model's hypothesis that social support facilitates an increase in deliberate rumination. The significant negative correlation between social support and deliberate rumination reported in section 4.3.3 also does not support the PTG model's hypothesis with regards the role of social support in the development of deliberate rumination. The lack of a significant relationship between social support and PTG also challenges the model's hypothesis. The regression model indicates that intrusive rumination and PTSS are more important in the development of deliberate rumination, than social support. The significance of these predictors is consistent with the pathway to PTG described by the model, with distress and initial intrusive rumination being requirements for the development of PTG. The positive correlations found between PTSS, PTG and both types of rumination are also consistent with this finding. This thesis, however, has not found evidence to support the suggested significant role of social support in the development of deliberate rumination and PTG.

These findings should be interpreted cautiously, however, given the exploratory nature of this analysis, using a relatively small sample size.

#### **4.3.5 Question 5: Relationship between PTSS and PTG.**

A medium significant positive correlation was found between PTSS and PTG for mothers only. The finding of a positive relationship is consistent with many previous studies that have explored this relationship (Barakat et al., 2006; Loiselle et al., 2011). The majority of the PTGI and IES-R subscales were also significantly positively correlated with each other (excluding 'relationship with others' and 'spirituality'). Interestingly, this significant positive relationship disappeared when examining correlation coefficients for the fathers only. Total PTSS and the intrusions subscale of the IES-R were significantly positively associated with the PTG subscale 'appreciation of life' however. Furthermore, the IES-R subscale of hyperarousal was significantly associated with 'spirituality.'

This is the first known study to look at the relationship between these variables by gender or by comparing parents. While only tentative conclusions can be made due to the small sample size, the potential for this relationship to be different for mothers and fathers is of theoretical and clinical interest. Fathers' lower scores on measures of PTSS and PTG may explain the lack of a significant relationship, compared to mothers. For fathers, the experience of premature birth and subsequent hospitalisation may not have triggered the process of trauma and, therefore, the potential for growth, like it seems to have done for mothers.

The cross-sectional, correlational design of this study limits what can be concluded with regards to the relationship between these two variables. The positive relationship may reflect the small sample of parents with overall, low levels of PTSS. With larger samples with a broader range of trauma symptoms, the relationship between these variables may be



different with a number of authors proposing the existence of a curvilinear relationship (Kleim & Ehlers, 2009; Kunst, 2010; Solomon & Dekel, 2007). Examination of the data visually and regression analysis did not indicate this type of relationship within this study.

The findings from this question do provide evidence for the related nature of these variables, in this study for mothers only, and, therefore the value of trying to understand the shared and separate aspects of their development pathways. This study has also highlighted the need to examine gender differences or differences between parents with regards to this relationship.

#### **4.3.6 Question 6. How important are other PTG model variables in the development of PTG?**

The regression model indicates that, controlling for gender, deliberate rumination was the only significant predictor of PTG. This is consistent with previous findings (Nightingale et al., 2010; Stockton et al., 2011; Taku et al., 2008). As suggested with regards the findings of research question 2; deliberate rumination appears to be a significant factor in the development of PTG, which supports the Tedeschi and Calhoun (2004) model of PTG.

Caution should be taken when interpreting and generalising this model however, given the large correlations between PTSS and rumination (indicating potential multicollinearity) and the relatively small sample size used.

#### **4.3.7 Question 7. Differences between mothers and fathers.**

##### **4.3.7.1 Levels of PTSS in mothers and fathers (question 7a).**

Significantly more PTSS were reported by mothers than fathers in this study. This finding is consistent with findings from previous similar studies (Elklit et al., 2007; Lefkowitz et al., 2010; Pierrehumbert et al., 2003). These studies reported between 10 and 15% of mothers scoring in the range for a potential PTSD diagnosis. The results from the mothers in this study are consistent with this, with 18.9% scoring in this range. The low reports of PTSS in fathers in this study are also comparable with these studies.

A key question is, why does this difference exist between mothers and fathers? As discussed in section 1.5.4.2, it may be that factors specific to the birth experience for mothers, account for some of these trauma symptoms in mothers. This study is limited by its lack of control over such variables which include, experience of pain, type of delivery and levels of perceived control during the birth experience which have been evidenced within the literature as predictors of PTSS for women (Czarnocka & Slade, 2000; Lyons, 1998; Ryding, Wijma, & Wijma, 1998; Slade, 2006). In addition, as previously discussed, appraisals related to trauma, responsibility and expectations may differ between mothers and fathers. Coping strategies used by mothers and fathers may also provide explanations for such differences.

It is important to note that these findings are a snapshot of experiences at a particular time point. It may have been that at a different time point, this significant difference between mothers and fathers would have changed. For example, Shaw et al. (2009) found higher levels of PTSS in fathers at 4 months post discharge.

#### **4.3.7.2 Levels of PTG in mothers and fathers (question 7b).**

As predicted, significantly more PTG was reported by mothers than fathers in this study. This finding supports the findings of previous studies investigating PTG within parents in paediatric settings (Hungerbuehler et al., 2011; Jenewein et al., 2008; Schneider et al., 2011; Spielman & Taubman-Ben-Ari, 2009). The mean scores for mothers and fathers on the PTGI in this study, were comparable with the means reported by Hungerbuehler et al. (2011) who investigated parents of children with serious illnesses. Comparing these means with studies investigating parents of premature babies, they are much higher than those reported by Jenewein et al. (2008) and lower than those reported by Spielman and Taubman-Ben-Ari (2009) for both mothers and fathers. Barr (2011) reported similar means for mothers but slightly higher means for fathers. Direct comparison between such studies is difficult however, due to differences in the time of measurement, ranging from 3-4 weeks (Spielman & Taubman-Ben-Ari, 2009) to 4 years (Jenewein et al., 2008).

The findings indicate that despite the stress and trauma that parents can experience when having a premature baby hospitalised, both mothers and fathers have the potential to experience positive psychological changes. As discussed with regards to Question 7a, this study is limited by the difficulty in defining the source of PTG symptoms, for example, there is evidence in the literature of PTG following term childbirth (Sawyer & Ayers, 2009). Furthermore, variables purely related to the birth (e.g., type of delivery) have also been found to predict PTG. These were not controlled for in this study. This limits the extent to which we may understand the separate contributions of premature birth and hospitalisation in the development of PTG and PTSS.

#### **4.3.7.3 *Perceived social support (question 7c).***

There was no significant difference between reported perceived social support by mothers and fathers. This is consistent with the findings of Elklit et al. (2007) who also used the CSS, to investigate mothers and fathers of extremely and very low birth weight babies. These findings are in contrast to studies which have described increased seeking of social support in women, compared to men (Littlewood et al., 1991; Pinelli, 2000; Tamres et al., 2002). Interestingly, a recent study comparing social sharing in mothers and fathers of babies hospitalised on the NICU, reported that fathers' social sharing was mainly related to medical risk while mothers' was related to their emotional reaction (Coppola, Cassibba, Bosco, & Papagna, 2013). This could indicate that the source of distress for fathers is more related to objective medical characteristics of the child, compared to mothers. This hypothesis is not supported by this thesis however, as gestation and number of days hospitalised were significantly associated with PTSS for both mothers and fathers. Furthermore, number of health problems was not significantly associated with PTSS in parents.

The CSS is a measure of perceived social support, rather than of social support seeking behaviour or actual social support received. It may be that there were differences in seeking social support behaviours (e.g., calling friends and family). This would not necessarily translate into differences in perceived social support. Using more than one measure of social support may improve our understanding of potential gender differences and the types of support mothers and fathers benefit from throughout their experience on the NNU and after discharge.

#### **4.3.7.4 Rumination type (question 7d).**

With regards to levels of rumination, mothers reported significantly more intrusive and deliberate rumination than fathers. This is consistent with previous literature reporting higher levels of rumination in women compared to men (Tamres et al., 2002; Treynor et al., 2003). The significant positive correlations found between rumination and PTSS and PTG give support to the hypothesis that rumination is a significant process factor in the development of trauma and growth, particularly in this study for mothers. Mothers reported higher levels of both intrusive and deliberate rumination and higher levels of PTSS and PTG. Fathers, on the other hand, reported significantly lower levels of intrusive and deliberate rumination and significantly lower levels of PTSS and PTG.

Again the causal nature of the relationship cannot be identified; although the regression model conducted for research question 6, does support the hypothesis that deliberate rumination is predictive of PTG. Difficulty identifying causal relationships is a limitation shared with previous literature examining the role of rumination in the development of trauma and growth (Cann, Calhoun, Tedeschi, & Solomon, 2010; Nightingale et al., 2010; Siegle et al., 2004; Stockton et al., 2011; Taku et al., 2008), and while retrospective measures of cognitive processing at different time points (e.g., soon after the event versus currently) have been taken to try and better understand pathways (Nightingale et al., 2010), longitudinal studies are required to understand the causal relationships involved. The findings do support the value of differentiating between intrusive and deliberate rumination, particularly as deliberate rumination has been found to be more strongly correlated with PTSS than intrusive rumination.

#### **4.3.8 Other findings related to main measures.**

Consistent with previous research, mothers reported significantly higher levels of depression than fathers and depression was significantly positively correlated with PTSS and negatively correlated with social support. The significant positive correlation between PTG and depression is very interesting as this finding is in contrast to the majority of previous studies that have looked at this relationship (Dekel, Ein-Dor, & Solomon, 2012; Salsman et al., 2009; Waters, Shallcross, & Fivush, 2012). The finding is more consistent with Silva, Ownsworth, Shields, and Fleming (2011) who reported a significant positive correlation between the PTG subscale of appreciation of life and depressive symptoms. The authors cite this as evidence for the coexistence of emotional distress and growth as advocated by the PTG model.

The significant positive relationship between depression and PTG in this study may be due to overlap between depressive and posttraumatic stress symptoms (Moser et al., 2007; Thabet et al., 2004). Alternatively, both depression and PTSD may be separate disorder responses to trauma; both being products of the shattering of core beliefs and therefore, potential triggers for the growth process. On the other hand, the positive relationship between depression and PTG may be taken as evidence for the illusory side of PTG, with PTG being viewed as a self-deceptive coping response, attempting to counterbalance emotional distress (Taylor et al., 2000; Zoellner & Maercker, 2006).

While these findings are not consistent with the majority of previous research, they are not necessarily inconsistent with the model of PTG, with depression being another expression of emotional distress which might trigger cognitive processing that can result in PTG.

## **4.4 Methodological Limitations and Strengths**

### **4.4.1 Design.**

The study was exploratory in nature and used a cross-sectional, quantitative design. Parents completed self-report questionnaires at one time point which reduced burden on the study participants and also avoided the problems of attrition that can affect longitudinal studies. The main strength of the design used in this study is the recruitment of a clinical population. PTSS and PTG in parents of premature babies have not been investigated before and therefore the study is novel from this perspective. In addition, many studies carried out within this area do not investigate both mothers and fathers. The inclusion of both parents is viewed as a particular strength of this study. This exploratory study also provides preliminary evidence for the role of rumination type and social support in the development of PTG in this population, which are key aspects of the PTG model.

Despite its strengths, there are some important limitations of this study design. The reliance on correlational analysis for the exploratory questions does not allow for the investigation of any causal relationship between the variables (Barker et al., 2002). This is a limitation for many studies published in the area of PTSD and PTG research (Elklit et al., 2007; Jenewein et al., 2008; Spielman & Taubman-Ben-Ari, 2009). The cross-sectional nature of the design also did not allow for the investigation of variables over time. This would have been particularly helpful given the mixed findings in the literature with regards to the relationship between PTSS and PTG as well as the fact that little is understood about how PTG develops or changes over time. The time point chosen in which to investigate the variables (e.g., 4-8 weeks post discharge) was influenced by time points chosen by previous similar studies (Balluffi et al., 2004; Lefkowitz et al., 2010; Shaw et al., 2009; Spielman & Taubman-Ben-Ari, 2009). The time constraints of the thesis also limited the choice of time period. Every effort was made to ensure that participants completed the

questionnaires within this time period, however, given the reliance on postal questionnaires and the use of reminder letters, it is likely that a number of participants completed the measures more than two months post discharge.

Lastly, one of the measures (CSS) required participants to rate level of support retrospectively (i.e., whilst their child was on the unit). Retrospective reports may be subject to distortion and selective recall compared to reporting of symptoms and experiences currently. This measure did ask for current experiences of support however.

This study utilised self-report measures which may be influenced by social desirability and an over endorsement of positive items (Barker et al., 2002; Logan, Claar, & Scharff, 2008). The use of self-report measures has been found to be common among studies completed in this area of research (e.g., Barr; 2011) potentially due to the demands of employing a clinical sample to complete clinical interviews and the ability to distribute the questionnaires among a larger group of potential participants (Slade, 2006). Research in the area of trauma has been criticised for relying on self-report measures rather than using clinical diagnostic interviews (Zambaldi et al., 2010). This thesis, however, did not have the scope or aim to diagnose PTSD and self-report measures may act as good screens for trauma symptoms.

In summary, there are a number of weaknesses in the chosen cross-sectional, quantitative design. The exploratory nature of the study however, guided the choice of such a design.

#### **4.4.2 Sample.**

A strength of this study is the use of a clinical sample and the inclusion of both mothers and fathers. Parents of premature babies or babies hospitalised on an NNU are starting to gain more attention in terms of research. However, research within this population is still in its infancy, particularly within the area of PTSS and PTG and fathers



continue to be excluded. The inclusion criteria were set in order to recruit from a relatively homogenous group as much as this is possible. Parents of babies less than 1500g birth weight and under 29 weeks gestational age were excluded. This was done as babies of lower weight and gestational age may be considered as a separate clinical group, (e.g., very low birth weight; Elklit et al., 2007). Furthermore, it has been reported that parents of higher weight babies may experience more distress as a result of reduced emotional support from those around them compared to parents with lower weight babies (Elklit et al., 2007).

The small sample that participated in the study is a limitation, as it reduces its power in finding effects that might be there. There were a number of challenges which made recruiting large numbers of participants difficult. The relatively specific inclusion criteria increased the challenges of recruiting participants for this study, particularly as participation from both parents of a child was required. Furthermore, the original study procedure required a number of steps that needed to be taken before participants could take part (e.g., face to face contact with the researcher to gain consent on the NNU). This may have resulted in potential parents being missed as parents were not always on the unit when the researcher was. Furthermore it was not always convenient or appropriate for the researcher to gain consent when parents were on the unit. Despite information and consent to contact forms being left for parents to see, it was difficult to catch all of these potential parents in order to gain consent with this procedure. The response rate was low and did not result in the minimum sample size required. The amended procedure was designed to increase efficiency with the aim of increasing the response rate to the study. This procedure resulted in an increased response rate of 32% over a time period which was half of the original recruitment phase. Therefore, the second recruitment procedure was more successful.

This study is unfortunately not able to report on differences between those who took part and those who did not. However, given the characteristics of PTSD and depression (e.g., avoidance, anxiety, lack of motivation), those parents with the most difficulties may have been less likely to respond. The sample may not, therefore, be representative of all parents of premature babies. Furthermore, those who did respond may have underreported symptoms, again due to factors related to the characteristics of these difficulties such as avoidance, potentially because of fear around stigma and also potentially because of the imagined consequences of reporting these symptoms.

Finally, the sample used was not very culturally diverse with the majority of participants reporting their ethnic origin as White British and living in fairly rural areas. This likely reflects the relative limited cultural diversity within the geographic area of East Anglia. This limits, therefore, what may be generalised from these findings, to parents within other cultures. The concept and measurement of PTG within different cultures is further commented on in section 4.7.4.

#### **4.4.3 Measures.**

The measures used within this study have all demonstrated good reliability and validity from previous research and were found to have good internal consistency within this study. The primary measures in this study, the IES-R and PTGI are widely used within research and have both been used with samples of parents of premature or hospitalised infants with good psychometric properties reported (Colville & Cream, 2009; Kersting et al., 2004; Taubman–Ben-Ari et al., 2011). In addition, the CES-D has been widely used in research with a range of populations including mothers of premature or medically fragile children (Mew et al., 2003; Miles & Holditch-Davis, 1997) with reported good psychometric properties. A limitation of the CES-D is the inclusion of questions which assess biological

aspects of depression (e.g., sleep deprivation) which overlap with symptoms usually experienced, following the birth of a baby (Edmondson, Psychogiou, Vlachos, Netsi, & Ramchandani, 2010).

The ERRI is a relatively new measure and recent studies have reported good internal consistency for both subscales (Cronbach's  $\alpha$  between .87 and .95) (Groleau et al., 2012; Triplett et al., 2011). The lack of previously reported psychometric properties specific to the use of this measure with parents of premature or hospitalised infants is a limitation.

The CSS has been used with similar populations, that is, bereaved parents and parents of chronically ill children (Gudmundsdóttir, Elklit, & Gudmundsdóttir, 2006; Nielsen, 2003). Gudmundsdóttir et al. (2006) reported satisfactory reliability and validity following the removal of one of the items whilst Nielsen (2003) reported poor psychometric properties but do not report on how this was dealt with. Previous good psychometric properties are reported for this scale (Elklit et al., 2001; Joseph et al., 1992) and in the current study the measure's reliability and validity was good.

There are a number of variables that could have been measured and included in the analysis including, anxiety, experience of previous trauma, birth factors and whether the participants appraised their experience as traumatic as defined by the DSM-IV criteria for PTSD. Experience of previous trauma is a predictor of further PTSS (Brewin et al., 2000; Bronner et al., 2010; Ozer, Best, Lipsey, & Weiss, 2003) and the experience of helplessness, fear or horror are what define an experience as traumatic according to DSM-IV. In order to have incorporated these factors, the Posttraumatic Diagnostic Scale (PDS) (Foa, Cashman, Jaycox, & Perry, 1997) could have been used as it contains a trauma checklist and assesses all DSM-IV criteria for a diagnosis of PTSD. This check list would also most likely have captured parents' previous experiences of birth trauma or admissions

on to an NICU, which was not identified in this study. Again, such previous experiences may have impacted on the parents' experiences and symptoms measured within this study. The PDS is, however, a lengthier measure compared to the IES-R. Furthermore, the aim of the study was to investigate PTSS, not diagnose PTSD and these symptoms can be experienced by individuals regardless of whether they appraise the event to have been traumatic or not (Soet, Brack, & DiIorio, 2003) suggesting that the data is useful and meaningful without this measure of appraisal.

Alternatively, a measure specific to the NICU environment could have been used, in the form of the Parental Stressor Scale: Neonatal Intensive Care Unit (PSS:NICU) (Miles, Funk, & Carlson, 1993). This is not, however, a measure of PTSS, but used in addition with a measure of PTSS, could have provided interesting information with regards to triggers for PTSS in this specific environment. This links to a limiting factor of this study which is the difficulty in separating between trauma experiences related to the general birth experience and those related to the specific experience of premature birth and those related to the hospitalisation of the baby. While the questionnaires directed parents to think about the experience of having a premature baby, hospitalised; there may have been other factors (such as those related to delivery) which were not controlled for, which may have been more predictive of symptoms reported.

The study may also have benefited from more detailed information with regards to the child's medical situation in terms of severity and complexity in order to better understand the relationship between objective medical illness and symptoms in parents.

A very small proportion of the data were missing, suggesting that the measures were relevant to the participants and did not include questions that were particularly difficult to answer.

#### **4.4.4 Analyses.**

The small sample size meant that more complex types of analysis could not be employed in this study. Path analysis, for example, could have resulted in a greater understanding of the relative importance of the variables explored, in terms of the development of PTG. The reliance on correlational data also meant that causal relationships could not be ascertained.

The sample size did allow the primary research questions to be answered however and despite the small sample, the study has been able to use regression analysis, in addition to correlational analysis and comparison of means, to test aspects of the PTG model as well as explore differences between mothers and fathers.

### **4.5 Theoretical Implications of Research Findings**

#### **4.5.1 Models of PTSD.**

##### ***4.5.1.1. Role of rumination in PTSS.***

This study provided evidence for the potential development and maintenance role of rumination in the experience of PTSS as described by cognitive models of PTSD (Ehlers & Clark, 2000; Wells & Sembi, 2004a, 2004b). The significant correlation between deliberate rumination and PTSS is less easily explained by PTSS models. The large positive correlation between deliberate rumination and intrusive rumination (on both the ERRI and IES-R subscale) and the finding from research question 4 that intrusive rumination explained 13% of deliberate rumination variance, may suggest that one form of rumination triggers the other. It could be hypothesised that deliberate rumination maintains intrusions rather than reduces them. These tentative hypotheses require more robust statistical analysis and enhanced power to investigate.

#### **4.5.1.2. *Role of social support in PTSS.***

This study provided evidence for the potential development and maintenance role of lack of perceived social support in the experience of PTSS. This is consistent with previous literature reporting this relationship (Ford et al., 2010; Holditch-Davis et al., 2003; Singer et al., 1996). The cognitive and metacognitive models of PTSD (Ehlers & Clark, 2000; Wells & Sembi, 2004a, 2004b) suggest that the quality of social support influences the development of positive versus negative appraisals of the trauma and the self, and, therefore, the choice of coping strategies used.

In this study, for mothers only, perceived social support was significantly negatively correlated with PTSS, particularly avoidance and hyper-arousal. It may have been that social support was more important to mothers in this study, with reduced social support increasing the experience of avoidance and hyper-arousal symptoms of PTSD. Alternatively, these symptoms may have resulted in reduced perceived social support. This correlational study is unable to ascertain which.

The significant negative relationship between social support and deliberate rumination is also of interest, particularly given the positive correlation between deliberate rumination and PTSS. It may be that reduced perceived social support results in individuals having an increased need to make sense of their experience, therefore triggering deliberate rumination. While deliberate rumination appears to be predictive of PTG, it is also positively related to PTSS, highlighting the potentially complex role of rumination in the development of PTSS and PTG.

#### **4.5.1.3 Differences in PTSS between mothers and fathers.**

This study demonstrated the existence of both PTSS and PTG in parents of premature babies who have been hospitalised on a NNU. The significantly higher levels of both PTSS and PTG in mothers compared to fathers are consistent with the majority of research (Buchi et al., 2007; Buchi et al., 2009; Elklit et al., 2007; Jenewein et al., 2008; Lefkowitz et al., 2010; Pierrehumbert et al., 2003; Spielman & Taubman-ben-Ari, 2009) and suggest a need to understand these differences from a theoretical perspective. As previously discussed, this difference may be explained by unique differences in the birth experience for men and women.

The applicability of the cognitive model of PTSD (Ehlers & Clark, 2000) to the experience of childbirth has been supported by Ford et al. (2010) and Sawyer and Ayers (2009). They described aspects of the model such as prior trauma experiences, prior beliefs and coping, trauma characteristics (i.e., use of birth interventions, and support and control during childbirth) and post-traumatic cognitions as contributing to the experience of PTSD in mothers following term childbirth. These are variables not examined within this study and, therefore, may account for a portion of the variance in PTSS for mothers which is not seen in fathers. For example, Sawyer and Ayers (2009) reported that over half of the variance of PTSS in women was accounted for by internal and external control during birth and avoidant coping.

More broadly, the experience of previous trauma is a documented predictor of PTSD following a traumatic experience. It has been documented that traumas more likely to occur to women, such as sexual abuse and intimate partner violence act as significant predictors of later PTSD, and, therefore, this may contribute to gender differences in the experience of PTSD (Moser et al., 2007; Nemeroff et al., 2006). As already stated, this

study did not assess parents' previous trauma history and, therefore, cannot account for the significance of such variables in this population.

#### **4.5.2 Model of PTG.**

##### **4.5.2.1. *Role of rumination in PTG.***

The significant positive correlations found between rumination and PTSS and PTG give support to the hypothesis that rumination is a significant process factor in the development of trauma and growth. Consistent with this, the intrusions subscale of the IES-R was the subscale most strongly related to PTG in mothers.

Furthermore, this thesis has provided evidence for the potentially significant role deliberate rumination has in the development of PTG. The findings from research question 2 and 6 in particular, offer support for the hypothesised role of deliberate rumination in the Tedeschi and Calhoun (2004) model of PTG. This thesis has also demonstrated the indirect role of intrusive rumination in the development of PTG, as it significantly contributes to the development of deliberate rumination which, as just discussed, significantly contributes to PTG development. The results do raise further questions with regards the model of PTG. This is because deliberate rumination was more strongly related to PTSS than PTG. It may be argued that this is evidence for the illusory nature of PTG, suggesting that with increasing emotional distress there is an increased need to create positive appraisals that attempt to counterbalance this experience of distress.

The results indicate that both types of rumination have a role in maintaining distress whilst contributing to growth. This supports the assertion that some level of distress is required for growth, as put forward by the model of PTG. This is further supported by the significant positive relationship between PTSS and PTG for mothers.



Overall, deliberate rumination appears to be more important in the development of PTG, than intrusive rumination. Deliberate rumination was however most strongly predicted by PTSS and intrusive rumination, highlighting the role of distress in the development of PTG, as described by the Tedeschi and Calhoun (2004) model of PTG.

#### ***4.5.2.2 Role of social support in PTG.***

The findings from this thesis do not support the hypothesised role of social support in the development of deliberate rumination and PTG, as proposed by the model of PTG (Tedeschi & Calhoun, 2004). Social support was found to be significantly negatively related to deliberate rumination for both mothers and fathers. Few studies have investigated the relationship between social support and rumination and the majority report a positive relationship (Morris & Shakespeare-Finch, 2011; Rimé et al., 2010). The findings from this thesis may be interpreted to suggest that when support levels are very good, there is less of a need to engage in a deliberate process of meaning making. Such a hypothesis, however, requires more robust exploration. Social support was also not significantly related to PTG which is contrast to the majority of the literature that has examined this relationship (Cieslak et al., 2009; Cohen & Numa, 2011; Frazier et al., 2004; Hungerbuehler et al., 2011; Leung et al., 2010; Maguen et al., 2006; Özlü, 2010; Tallman et al., 2010).

It should be noted that the overall very high rates of social support may have hidden any potential effects of this variable on rumination and PTG. Furthermore, it may have been that the CSS did not identify the forms of support significant in the development of PTG.

#### ***4.5.2.3 Differences in PTG between mothers and fathers.***

This study has demonstrated the experience of growth in parents of premature babies who have been hospitalised on a NNU. As discussed in section 4.5.1.3, the finding that mothers experienced significantly higher levels of PTG than fathers suggests a need to understand this at a theoretical level. Again, as discussed, variance related to the birth experience for mothers may explain some of this increase for mothers. Having said this, Sawyer and Ayers (2009) found few associations between birth variables and growth in mothers following term birth, with just under 90% of the variance in growth left unaccounted for. They suggested that support after the event may be more important than support during the event in relation to development of PTG. This is not supported by this study with social support being unrelated to PTG for both mothers and fathers. Interestingly however, the trend for parents is different; positive for mothers and negative for fathers. This tentatively suggests that the role of social support in the development of PTSS and PTG may be different for mothers and fathers.

As discussed in 4.5.1.3, measuring cognitive appraisals (e.g., event centrality, severity of threat, challenge to core beliefs), may contribute to our understanding of which factors contribute to differences in the experience for mothers and fathers. This study has found that mothers report experiencing significantly more deliberate and intrusive rumination than fathers. This is consistent with literature that has suggested that women experience more rumination than men (Tamres et al., 2002; Treynor et al., 2003). The findings from this study tentatively suggest that rumination could be a factor that differentiates trauma and growth outcomes for men and women.

#### ***4.5.2.4 Relationship between PTG and PTSS.***

The study's findings of a significant positive relationship between PTSS and PTG are consistent with the majority of previous literature (Barakat et al., 2006; Loiselle et al., 2011) and support the model of PTG in terms of distress and PTG coexisting. The study contributes further information to this literature by finding this relationship in mothers but not fathers. Had the sample of fathers been greater, this finding may have been different. A recent longitudinal study supports the prediction made by the PTG model that growth is a response to distress and not vice versa (Dekel et al., 2012). It is possible that had this study had a broader range of PTSS, a curvilinear relationship may have been found, as proposed by several authors (Kleim & Ehlers, 2009; Kunst, 2010; Solomon & Dekel, 2007). This study has replicated the findings of previous studies in a new population which adds weight to the argument that the concepts of PTG and trauma are relevant when considering the experiences of parents with premature babies that have been hospitalised.

#### ***4.5.2.5 Role of time in PTG.***

These results give an indication of the relationships that are significant at one particular time point; 4 to 8 weeks following discharge from hospital. The model being tested is not static and describes processes and changing relationships over time. It may be therefore expected that if these parents were re-tested 12 months post discharge for example, the findings would be different. Based on the PTG model, it might be predicted that, soon after the event, PTG levels might be lower as the cognitive processing required to bring about growth is in its early stages. However, with increasing time and opportunity for cognitive processing, levels of PTG may be expected to increase. It is difficult to draw conclusions with regards to this based on this cross-sectional, correlational study. The evidence for the existence of both intrusive and deliberate rumination in this study

indicates that cognitive processing in response to the event was occurring, although based on the PTG model it may have been predicted that levels of intrusive rumination would be higher than deliberate rumination, in these early stages. It may be that significant differences between these types of rumination are seen in the acute phase (e.g., less than 4 weeks since discharge).

## **4.6 Clinical Implications**

### **4.6.1 PTG.**

This study showed that mothers and fathers who have had a premature baby, hospitalised on a NNU may experience both trauma and growth symptoms. This indicates the need for clinicians to consider parents' experiences holistically and to consider PTG as a further potential process and outcome of coping with trauma. One of the values of identifying this concept of PTG is to shift the focus away from purely deficit focused models and broaden clinical perspectives. This is argued to be important in order to influence clinician's knowledge and attitudes when working with patients coping with trauma, so that the potential for growth may be recognised by them and the patient. An awareness of concepts such as PTG is argued to bring the focus away from 'reducing symptoms' and highlights underlying beliefs, narratives and meanings that are important to identify when working therapeutically with individuals and families. Zoellner and Maercker (2006) also suggested that PTG may bring attention to the 'what for' aspect of meaning-making, as opposed to an often predominant and potentially unhelpful focus on 'why'.

The concept of PTG also links to the growing use of models of adjustment and acceptance, often used in trauma and clinical health settings, for example Acceptance and Commitment Therapy (ACT) (Hayes, 2004) and Compassion Focused Therapy (CFT)

(Gilbert, 2009). ACT is a third wave CBT approach which emphasises changing the context in which experiences occur, to change their function, as opposed to striving to change the content of experiences. It draws from and expands on behaviourism, is present focused, and aims to support individuals to move towards accepting their thoughts and feelings, clarify their values and mobilise behavioural change (Hayes, 2004). CFT is an approach which draws from neuropsychology, attachment and evolutionary theories, originally developed for people with complex mental health problems presenting with high levels of shame and self-criticism. The approach describes three types of emotion regulation systems (threat, drive and compassion system) which guide cognition and behaviour. As a result of life experiences these systems may become out of balance with each other, with the aim of CFT being to enhance an individual's compassionate system and therefore their ability to be compassionate to others and themselves (Gilbert, 2009).

Given the increasing use of these approaches and their growing evidence base, it makes theoretical and clinical sense for there to be increasing awareness of concepts such as PTG, in order for these experiences to be identified and potentially facilitated by clinicians.

Authors have described how PTG may be incorporated into therapeutic approaches, for example Tedeschi, Park, and Calhoun (1998) and Calhoun and Tedeschi (1999) discussed how clinicians can facilitate PTG by acknowledging the person's struggle and distress whilst supporting and encouraging positive changes that are described by the person. It may be argued that such guidance is therapeutically important in general, rather than being specific to facilitating PTG. Furthermore, a warning comes from Calhoun and Tedeschi (1999) and Zoellner and Maercker (2006), who highlighted the potential for patients to feel dismissed or their experience minimised, if clinicians suggest that they must or will grow from what they have been through. It seems that caution should be

taken when incorporating PTG ideas into therapeutic working, so that as with most therapeutic approaches, change comes from the patient, supported by the clinician, rather than it being ‘forced.’

While the clinical implications of this broader understanding of responses to trauma are potentially large, there is a need to remain cautious while the consequences of increased PTG on outcomes such as wellbeing, positive adjustment and effectiveness of psychological interventions are better understood. A review by Zoellner and Maercker (2006) reported mixed findings with regards the impact of PTG on adjustment outcomes. More recent studies, predominantly within oncology, (Park, Chmielewski, & Blank, 2010; Park, Edmondson, Fenster, & Blank, 2008; Sawyer, Ayers, & Field, 2010; Silva, Moreira, & Canavarro, 2012) but also within the general population (Cann, Calhoun, Tedeschi, & Solomon, 2010) have provided support for the positive impact of PTG on adjustment outcomes.

#### **4.6.2 PTSS in the NICU.**

The findings of this study lend support to the conceptualisation of the NICU as a potential traumatic stressor for parents, particularly mothers. It is therefore important that the NICU team working with parents are aware of this potential and have the knowledge and skills to assess and respond to this. The need for comprehensive assessments of parents which include a range of psychosocial factors has been raised by a number of authors (Balluffi et al., 2004; Holditch-Davis et al., 2003; Lefkowitz et al., 2010). With growing knowledge of risk factors for PTSD in general and in paediatric settings, assessing potential risk factors for parents may lead to more preventative support and interventions. Clinicians need to ask parents how supported they feel by different systems (e.g., NICU

staff teams, family, friends, work) and offer appropriate support, as low perceived social support is associated with increased PTSS and depressive symptoms.

The findings with regards to rumination also indicate a need for clinicians on NICU units to be aware of the cognitive world of parents; the appraisals they are making and how they might be cognitively trying to make sense of what has happened. Parents that are reporting intrusive thinking and deliberate attempts to make sense of what has happened may be experiencing higher levels of trauma symptoms and low mood. This is particularly important given the potential negative consequences of parent PTSS for parent-child attachment relationships, infant development and infant emotional behavioural regulation (Bosquet Enlow et al., 2011; Forcada-Guex et al., 2011; Pierrehumbert et al., 2003).

As indicated by this study and previous research, consideration of the potential different experiences for mothers and fathers should be given by NICU clinicians. The reason for distress may be very different between parents. Previous research has highlighted increased stress for fathers who spend less time with their partner and baby, whereas mothers may be distressed by the environment of the unit (Jackson et al., 2003; Lindberg et al., 2007).

Some supportive or preventative interventions have been trialled in NICU's around the world with some encouraging results. For example, Meyer et al. (1994) reported reduced levels of maternal depression and stress, improved feeding interactions and more sensitive responding upon discharge, for mothers who received an individualised intervention, based on an assessment of their particular needs. More recently, Jotzo and Poets (2005) reported significantly reduced PTSS upon discharge, in mothers who received a trauma-preventive psychological intervention, compared to control mothers (who could request counselling from the hospital minister). While the study would have benefited

from a baseline measure of PTSS upon admittance to the NICU, the findings are encouraging.

Many challenges remain however, including elucidating the key aspects of interventions that bring about change and a reduction in PTSS in these parents. Understanding this has important clinical implications in terms of identifying the most appropriate clinicians to facilitate such interventions. For example, if the most significant factor is the presence of someone who listens, this may be a role a clinician with less psychological training could carry out. Alternatively, if change comes about because of aspects attributed to the use of psychological models (e.g., working at the level of underlying cognitive appraisals, or supporting parents in imaginal re-living exercises), it is likely that clinicians such as psychologists will be best placed to support parents.

Furthermore, based on the findings of this study and previous literature examining PTG in paediatric settings, it is argued that clinicians need to be therapeutically skilled in order to facilitate adjustment through a balance between acknowledgement and validation of distress whilst identifying and reinforcing positive coping and potential for growth.

Finally, in a recent study which examined the resources of NICU's in the UK (Redshaw & Hamilton, 2010), it is reported that 47% of units studied, did not have the services of a social worker, psychologist, counsellor or psychiatrist. Given the growing evidence for the existence of mental health and adjustment difficulties within parents within these settings and the potential value of preventative and early intervention, this is a concerning figure.



#### **4.6.3 Fathers in research – clinical impact.**

It is also of note that the intervention studies just described did not include fathers. Jotzo and Poets (2005) reported that fathers were invited to take part but were not included in the data collection because it was usually mothers who were admitted with the infant. It may be argued that the predominant focus on mothers within paediatric research is supported by the findings of this study, given the increased symptomology of mothers. While fathers reporting symptoms of trauma and depression were in the minority, it is argued that there are number of reasons why this type of research should include fathers. Firstly, fathers reporting these symptoms were found in this study, even with a small sample size. Secondly, it is likely that the actual rates of PTSS and depression within the sample invited to take part in this study, were higher for fathers and mothers, as discussed in section 4.4.2. Previous research has also suggested that men may be less likely to express or share their feelings with others, compared to women (Tamres et al., 2002), which could translate to their responses on questionnaires. Therefore, low reports of symptoms or difficulties by fathers do not necessarily give an accurate picture. Thirdly, as argued by authors such as Phares et al. (2005), including both mothers and fathers allows similarities and differences between parents to be explored, whether this is in terms of mental health symptoms, coping or the influence they have on child outcomes. Even if for example, in future research fathers continue to show reduced symptoms of disorders such as PTSD compared to mothers, this tells us something important and interesting about gender, family roles, coping, cognition, identity and adjustment which will help when providing support and therapeutic interventions for families. For example, research focusing on fathers' experiences in the NICU has highlighted key roles and needs of fathers, for example, putting their partner and baby first, wanting to be included more and wishing to share their experiences (Jackson et al., 2003; Lindberg et al., 2007).

The term ‘family centred care’ within the NICU, is used to describe an approach which has the objective of increasing partnership between parents and staff in order to improve outcomes, for example, parent satisfaction and confidence, mental health and length of stay (Cooper et al., 2007; Griffin, 2006; Malusky, 2005; Muething, Kotagal, Schoettker, del Rey, & DeWitt, 2007; Redshaw & Hamilton, 2010; Sweeney, 1997; Voos et al., 2011). With approaches to care and support in the NICU aiming to be family-centred, there is a clear need to include fathers in NICU based research. Inclusion of fathers in paediatric research will be discussed further in section 4.7.6 providing reflections, considerations and ideas for future studies.

#### **4.7 Future Research**

The literature reviewed and the research findings have highlighted several important areas that should be addressed in future research.

##### **4.7.1 Testing the PTG model.**

The findings of this thesis indicate the potential significant role of intrusive and in particular, deliberate rumination in the development of trauma and growth. Future studies with increased power would benefit from examining further, the variables that are significant in the development of PTG. This thesis also found a strong relationship between deliberate rumination and PTSS which requires further exploration as this potentially challenges the PTG model and raises questions about the differential role of intrusive and deliberate rumination.

The findings with regards social support also require further examination, as they challenge an important process described by the Tedeschi and Calhoun (2004) model of PTG. Few studies that have investigated the relationship between social support and

rumination. Consistent with the model of PTG, Morris and Shakespeare-Finch (2011) and Rimé et al. (2010) reported positive correlations, whilst Benetato (2011) and Cryder et al. (2006) reported a negative and no relationship, respectively. These mixed findings warrant future studies to test these relationships using longitudinal designs and more robust statistical analysis. Future studies may also wish to use multiple measures of social support. Furthermore, measures which identify the level of self-disclosure may test this aspect of the PTG model more sensitively.

This thesis has provided further evidence of a positive relationship between PTSS and PTG, but this was not found for fathers. It would be beneficial to examine this relationship between mothers and fathers in future studies, using a larger sample size. The small sample size of this study may have resulted in the study being underpowered. Larger scale studies are required to more comprehensively explore the role of rumination and social support in the development of PTSS and PTG.

Prospective or experimental studies using techniques such as path analysis would potentially provide important information about the development of trauma and growth over time and causal relationships. This is particularly as the model of PTG outlines an on-going process and this study was only able to capture one moment in time.

#### **4.7.2 Explaining differences between mothers and fathers.**

The findings that mothers experienced more PTSS and PTG than fathers are consistent with previous research. The reasons for this difference, however, are still unclear. A limitation of this study is the inability to account for the potential influence of birth related factors such as control, pain, type of delivery as well as previous experiences of trauma. Future studies would benefit from measuring and controlling for these variables as this may partly explain the difference in PTSS and PTG between mothers and fathers.

#### **4.7.3 Inclusion of other variables.**

Future studies may wish to include measures of cognitive appraisals. This study did not measure whether the event was perceived as traumatic by parents, as defined by criterion A for a formal diagnosis of PTSD. Future studies may wish to include this in order to more strictly measure whether the NICU may be classed as a potential traumatic stressor. This would also provide further information about the relationship between such appraisals and symptoms of trauma, as previous research has found PTSS when the event has not been appraised as traumatic (Soet et al., 2003) and vice versa (Zambaldi et al., 2010), which may challenge the diagnostic criteria of PTSD.

The model of PTG also highlights the need for the shattering of assumptions to start the process of growth. Repeating this study with the addition of a measure of the challenge to core beliefs, for example, using the Core Beliefs Inventory (CBI); Cann, Calhoun, Tedeschi, Kilmer, et al. (2010) would provide a further test of the PTG model. Furthermore, future studies may wish to consider measures of appraisals relevant to the population of study, that is, responsibility, expectations, control and the centrality of the event (Boals, 2010; Boals & Schuettler, 2011; Boals et al., 2010; Czarnocka & Slade, 2000; Pelchat et al., 2003; Schuettler & Boals, 2011). This may provide information with regards to differences between mothers and fathers as well as about variables potentially important in the facilitation of trauma and growth.

Using a measure of post-partum depression, which avoids assessment of symptoms which are a normal part of adaptation following the birth of a child (e.g., sleep disturbance) may be helpful for future studies. The Edinburgh Postnatal Depression Scale (EPDS) developed by Cox, Holden, and Sagovsky (1987) does just this, and has been widely used in studies investigating postnatal depression in mothers (Gibson, McKenzie-McHarg,

Shakespeare, Price, & Gray, 2009) as well as in some studies investigation postnatal depression in fathers (Matthey, Barnett, Kavanagh, & Howie, 2001; Ramchandani, Stein, Evans, & O'Connor, 2005).

#### **4.7.4 Extending our understanding of PTG.**

In order to better understand the potential impact of PTG on parents within paediatric settings, future research would benefit from focusing on consequences for adjustment outcomes, beyond that of mental health symptoms.

If future research suggests that increases in PTG support positive adjustment, quality of life and improved functioning, this increases the value of PTG and the need for integration of this concept into psychological models and interventions. Again, the use of prospective designs will be important when trying to answer such questions. Exploring these questions will also provide further information to inform the discussion around the potentially illusory nature of PTG and ultimately whether it is a helpful or unhelpful process and outcome for people.

Related to this is the need to develop culturally relevant conceptualisations of PTG. Splevins, Cohen, Bowley, and Joseph (2010) argued that as theories of PTG have been developed in the West, there is a danger of trying to impose theories which are biased to the conceptions of individualistic societies on other cultures. It is argued that the concept of growth has the potential to be relevant in many different cultures, but that the use of instruments developed in the West may not be appropriate. Therefore, it would be interesting to explore the experiences of parents of premature babies in non-western cultures. The use of qualitative methods may be a good way of finding out whether concepts of trauma and growth are also relevant in these cultures.

#### **4.7.5 Consideration of sample studied.**

Future research may wish to compare parent trauma and coping responses across low risk and high risk infants, using more comprehensive measures of infant medical status. It would also be interesting to repeat the study and include all parents who have babies admitted onto the NICU to compare parents of premature babies hospitalised to other groups (e.g., very low birth weight, extremely low birth weight and term babies with health problems). This would provide an opportunity to learn about the similarities and differences between the experiences and needs of these different groups of parents. In addition it might allow greater understanding of the different potential contributors to the experience of trauma and growth, for example, the shared NICU environment, shared experiences across a 'diagnostic group' (e.g., premature baby) and individual characteristics of that parent. It would also be helpful to repeat this study but include a comparison group of parents of term babies who were not hospitalised as a way of understanding the contribution of prematurity and admission to intensive care in the development of trauma and growth.

#### **4.7.6 Increasing overall participation and recruitment of fathers.**

A very important area for future research to consider is how to increase the inclusion of fathers in studies such as this one. It would be very interesting to ask those fathers that did not take part, their reasons for this. For example, it may be that the way this study was described and presented was more 'female orientated' and may have been interpreted by some fathers as not relevant to them. Qualitative research asking these types of questions and exploring potential barriers for fathers taking part in paediatric research such as this, would be really valuable.

Based on this study and reflections from previous studies there are a number of considerations for increasing participation of fathers in paediatric research. Firstly, it is recommended that it is made clear in the research documentation that participants receive, that the research is interested in both mothers and fathers experiences. Future studies may wish to make the need for fathers to take part more explicit (i.e., highlighting previous lack of participation from fathers, resulting in less understanding of fathers' experiences). Costigan and Cox (2001) recommended approaching fathers directly, rather than relying on mothers to act as gatekeepers. This can be challenging in environments such as the NICU where mothers may be present on the unit more than fathers. Researchers should therefore make efforts to be available on units at times when fathers are more likely to be present (e.g., after normal working hours).

Some NICU's or charitable organisations may run support groups specifically for fathers, which would be a good place to approach fathers about taking part in research. Research may benefit from asking fathers who have previously had a premature baby hospitalised to act as an advisor and advocator of the project. This is in keeping with the National Health Service's (NHS) aim to increase the involvement of service users in research and service development (Consumers in NHS Research, 2000). This may increase the likelihood of fathers taking part. Phares et al. (2005) has suggested that fathers may be more likely to take part in research if they are approached by a male researcher rather than a female researcher. Ultimately, there seems to be a real need to ask fathers about their experience of being involved in or approached about paediatric research. This information will be vital in improving participation in these types of research studies.

Furthermore, the increased response rate gained from the second phase of recruitment which was over a shorter period of time, suggests that it would have been more

effective to recruit parents using this postal approach throughout. While this method of implied consent was deemed acceptable by the ethics committee and local research and development groups approached within this study, it may be that not all hospitals would accept this procedure. Both approaches have benefits and limitations and future research may wish to focus on identifying optimum recruitment procedures for use within paediatric settings. As discussed, consideration of potential differences between mothers and fathers within this is important.

#### **4.8 Conclusions**

The thesis aimed to test key aspects of the Tedeschi and Calhoun (2004) model of PTG, in mother-father pairs, 4-8 weeks following the discharge of their premature baby from the NICU or NNU. A secondary aim of the thesis was to compare levels of PTSS and PTG in mothers and fathers. Firstly, the relationship of both intrusive and deliberate rumination with PTSS and PTG was investigated and secondly, the role of social support in the development of deliberate rumination was examined. The significant variables involved in the development of deliberate rumination and PTG were also explored. Finally, the type of relationship between PTSS and PTG was explored and differences between mothers and fathers for the main variables were examined.

Although based on a small sample and a cross-sectional design, the study provided preliminary evidence for the increased risk of mothers who have had a premature baby hospitalised, developing PTSS. Furthermore, the findings of this study suggest that increased PTSS in mothers is significantly associated with increased PTG, with mothers reporting significantly increased levels of PTG also. This supports the hypothesis of the model of PTG, that on-going PTSS are necessary for the development of PTG. In addition this finding raises questions about the potential differences between the pathways of



trauma and PTG development for mothers and fathers which is not known to have been examined previously within parents of premature babies. The significant role of rumination in the development of PTSS and PTG for both mothers and fathers is highlighted by this study also. Interesting preliminary findings with regards the role of social support in the development of growth have also been found, which do not support the PTG model's hypothesis that social support facilitates the development of PTG.

It is important to acknowledge the study's methodological limitations and, therefore, the results should be taken as preliminary, tentative hypotheses to be tested by larger, more powerful studies. The findings from this study do, however, highlight the potential for parents, particularly mothers, to experience both trauma and growth symptoms as a result of their experience, which is of theoretical and clinical importance.

It is argued that parents may benefit from provision of more comprehensive and holistic assessments of risk factors and symptoms of low mood, trauma and potential for growth whilst their baby is in the NICU so that appropriate support or interventions can be provided. In order to better understand the different needs of mothers and fathers, future studies need to carefully consider how to increase participation, particularly of fathers.

This study is unique in its investigation of both PTSS and PTG in mothers and fathers of premature babies, hospitalised on a NNU. It has provided preliminary evidence for the potentially significant role of rumination, in the development of both PTG and PTSS and it has raised questions with regards the hypothesised role of social support in the development of PTG. Future studies should be carried out with larger samples, using more complex designs in order to understand the development of these constructs over time, comparing mothers and fathers. There is also a need to understand which factors explain the differences found between mothers and fathers in this study. Lastly, greater

understanding of the unique experience for parents of hospitalised, premature babies may come with comparing outcomes to other groups, for example, hospitalised term babies.

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## Appendix A

### DSM-IV Criteria for PTSD Diagnosis

- Criterion A; the person has been exposed to an event or events that involve actual or threatened death or serious injury, or a threat to the physical integrity of oneself or others and the person's response involved intense feelings of fear, helplessness or horror.
- Criterion B; the traumatic event is persistently re-experienced in at least one of the following ways: 1) Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions, 2) Recurrent distressing dreams of the event, 3) Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur upon awakening or when intoxicated), 4) Intense psychological distress at exposure to internal or external cues that symbolise or resemble an aspect of the traumatic event, 5) Physiologic reactivity upon exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.
- Criterion C; there is persistent avoidance of stimuli associated with the trauma and a numbing of general responsiveness as indicated by at least three of the following: 1) Efforts to avoid thoughts, feelings, or conversations associated with the trauma, 2) Efforts to avoid activities, places, or people that arouse recollections of the trauma, 3) Inability to recall an important aspect of the trauma, 4) Markedly diminished interest or participation in significant activities, 5) Feeling of detachment or estrangement from others, 6) Restricted range of affect, 7) Sense of foreshortened future.

- Criterion D; persistent symptoms of increasing arousal indicated by at least two of the following: 1) Difficulty falling or staying asleep, 2) Irritability or outbursts of anger, 3) Difficulty concentrating, 4) Hyper-vigilance, 5) Exaggerated startle response.
- In addition to these criteria, for a diagnosis to be given the duration of the symptoms needs to have been more than one month and must have caused clinically significant distress or impairment in important areas of functioning such as social or occupational.
- Furthermore, PTSD may be specified as acute if the duration of symptoms is less than three months or chronic if more than three months. A delayed onset is specified if the symptoms began at least six months after the stressor (DSM-IV, APA, 2000).

## Appendix B

**Consent to Share Contact Details Form**Emotional experiences of parents of premature infants

(Main Investigator: Josie Galpin, Trainee Clinical Psychologist)

1. I agree to my name and contact details

Please initial box

(telephone number, postal address)

to be passed to the researcher so that they can contact me

to discuss the study further.

2. I would like the researcher to contact me by:

Please initial boxes you agree to

- a. Telephone

- b. In person on the ward

- c. In person at home

---

Name of participant

---

Signature

---

Date

## Appendix C

**Participant Information Sheet****Emotional experiences of parents of premature infants**

You are being invited to take part in a research study about the experience of parents who have premature babies. This information sheet will tell you about the study so that you are able to decide whether you would like to take part or not.

**What is the purpose of the study?**

The aim of the study is to find out more about the emotional experiences of mothers and fathers of babies who are born early (premature). The findings of this study will help to understand more about the experiences of parents and will help us to identify better ways of helping and supporting parents.

The study is being completed as part of the researcher's Doctorate in Clinical Psychology at the University of East Anglia (UEA) where the main researcher is studying as a trainee clinical psychologist.

**Why have I been invited?**

The study is focused on the experiences of birth mothers and fathers (18 years and over) of premature babies of gestational age 29-36 weeks of birth weight higher than 1500g. You have been invited because you are a parent of a premature baby identified by staff as matching these criteria.

**What does the study involve?**

The study involves filling out 6 questionnaires. One will ask you for some basic information about yourself and your child. The other five will ask you about your levels of distress, mood, the support you have received, changes you may have noticed as a result of your experience and any repetitive thinking you have noticed related to your experience. The questionnaires take approximately 45 minutes to complete in total.

You will be asked to fill these questionnaires out between 4 and 8 weeks following the discharge of your child home.

You have the choice of having the researcher present whilst you fill out these questionnaires. The researcher can meet you at a time and place most convenient for you. You may prefer to fill the questionnaires out without the researcher present. In this case, the questionnaires will be sent to you and you will be provided with a stamped addressed envelope to return them once completed.

### **What do I need to do to take part?**

If you are interested in taking part, please complete the **Consent to Share Contact Details Sheet** and give this back to the nursing staff. The researcher will then be able to make contact with you to discuss the study further. Alternatively, please contact the researcher directly on the number below.

If you are still happy to take part after you have spoken to the researcher, you will be asked to sign a consent form agreeing to participate in the study. This consent form will also ask you to confirm that you agree to your GP being informed that you are participating in this study. Your GP will be informed by a letter. You will be asked to give permission for your GP to release information about the status of your child to the research team before you are given the questionnaires. This is required due to the gap in time between you consenting to take part in the study and filling out the questionnaires.

### **How will my answers be kept confidential?**

The information that you provide will be securely stored and kept anonymous and confidential. The questionnaires will have numbers on them, so you do not need to write your name on them.

### **What will happen to the results of the study?**

The study will be written up as part of the researcher's Doctorate in Clinical Psychology. If you would like, the researcher can send you a summary of the results.

### **Are there any risks involved?**

Some of the questions may raise concerns for some people. This is one of the reasons that the researcher offers to be present when you complete the questionnaires so that any concerns or issues raised can be discussed at the time. However, you may prefer to complete the questionnaires without the researcher present. If concerns are raised for you as you complete the questionnaires, please stop completing the questionnaires. Some people may experience distress or have concerns after completing the questionnaires. Support or advice is available through contacting:

- Your GP
- Bliss is a charity that supports premature and sick babies and their families.
  - The family support helpline is 0500 618 140
  - The website is [www.bliss.org.uk](http://www.bliss.org.uk)
- Patient Advice and Liaison Services (PALS) – phone number
- Independent Complaints Advocacy Services (ICAS) – 0845 456 1084



If your responses on the questionnaires indicate risk of harm to yourself or others, the researcher will need to inform the research supervisor and your GP.

**What if I do not want to take part?**

You do not have to participate in this study and even if you decide to take part you are able to stop taking part at any time without giving an explanation. Your decision will not affect your care or your infants care in the hospital. This study is separate from the hospital.

**How do I find out more?**

If you are interested in taking part but would like to talk to someone to find out more, then the researcher is able to meet you at the hospital or your home or wherever is most convenient or talk to you on the phone to answer any of your questions. You can contact the researcher via email or on the phone number below, or speak to one of the nurses and fill out the **Consent to Share Contact Details Sheet**.

Dr. Anna Adlam (supervisor for this research) is also available by phone (01603 591507) to discuss the study with you if you would like.

Thank you for considering taking part in this study.

Thank you for your time,

Josie Galpin (Trainee Clinical Psychologist)

**(07936 292 168)**

Postgraduate Office,  
Elizabeth Fry Building,  
University of East Anglia,  
Norwich NR4 7TJ

**Email address:** [J.Galpin@uea.ac.uk](mailto:J.Galpin@uea.ac.uk)

## Appendix D

**Participant Consent Form**Emotional experiences of parents of premature infants

(Main Investigator: Josie Galpin, Trainee Clinical Psychologist)

- |     |    |
|-----|----|
| Yes | No |
|-----|----|
- 
1. I confirm that I have read and understand the information sheet version 3, dated (15/12/11) for the above study and I have had the opportunity to ask questions. 

--	--
  
  2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason and without the medical care or legal rights of me or my child being affected. 

--	--
  
  3. I agree to my GP being informed of my participation in the study. I understand that if there are serious concerns about my levels of distress that my GP may need to be informed. 

--	--
  
  4. I agree for the GP to release details on the status of my child to the research team before I am given the questionnaires to complete. 

--	--

5. I understand that relevant sections of my medical notes and data collected during the study may be looked at by individuals from regulatory authorities or from the NHS Trust where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

6. I agree to take part in the above named study.

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

7. I am willing to be contacted by Dr. Anna Adlam or members of her research team about future studies.

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

(All studies will be subject to ethical review and approval.)

_____	_____	_____
Name of participant	Signature	Date

_____	_____	_____
Researcher	Signature	Date

Appendix E

GP Letter

Dear Dr. XXXXX

I am writing to inform you that your patient, XXXXXXXX has given consent to participate in the research study below:

‘Posttraumatic stress and growth symptoms in parents of premature babies: the role of rumination and social support.’

This study is being carried out in part completion of a doctorate in clinical psychology at the University of East Anglia (UEA).

The study requires participants to complete 6 questionnaires, 4-8 weeks following the discharge of their baby from the neonatal intensive care unit (NICU).

**The researcher will contact the GP surgery before the participant is given the questionnaires to complete, to check the status of the baby. The participant has given permission for you to release information about the status of the baby to the researcher. A copy of the Consent Form is enclosed.**

**Participants will also be advised to contact their GP in the event of any concerns about their mental health.**

If you would like a copy of the questionnaires or have any questions or concerns, please contact myself or Dr. Anna Adlam on the number below **before the XXDATEXX**.

Yours sincerely,

Josie Galpin

Trainee Clinical Psychologist

Dr. Anna Adlam

Clinical Psychologist, Lecturer on Clinical Psychology Doctorate, UEA

Appendix F

Covering Letter

Dear XXXXXX

Thank you for consenting to take part in the **Emotional Experiences of Parents of Premature Babies Study**.

Enclosed is the questionnaire pack for you to complete. If possible, please try and complete these questionnaires **within 2 weeks** of receiving the pack. Once you have completed the questionnaires, please return the pack in the pre-paid envelope enclosed. **If you decide that you no longer wish to take part in the study it would be helpful if you could return the questionnaire pack blank.** If I have not received the questionnaire pack from you within 4-5 weeks of sending it to you, a reminder letter will be sent to you.

**If you become upset or distressed whilst completing the questionnaires please stop completing them.** A list of useful contact numbers for places to gain support is included in the **Information Sheet** which is also enclosed. Furthermore, if you have any questions please feel free to contact me on the number below.

If you would like to receive a summary of the results of this study please indicate this on the final page of the questionnaire pack.

Thank you again for taking part in this study.

Best Wishes,

Josie Galpin  
Trainee Clinical Psychologist  
Researcher

**(07936 292168)**

Appendix G

Reminder Letter

Dear XXXXX

Thank you for consenting to take part in the **Emotional Experiences of Parents of Premature Babies Study**.

I previously sent you a questionnaire pack to complete. This letter is just to remind you to complete these questionnaires as soon as you can and return them in the pre-paid envelope.

If you have decided that you do not wish to take part in the study, it would be helpful if you could return the questionnaire pack blank.

If you have any questions, do contact me on the number below.

Thank you again for taking part in this study.

Best Wishes,

Josie Galpin  
Trainee Clinical Psychologist  
Researcher

**(07936 292168)**

## Appendix H

## Covering Letter – Second Recruitment Phase

Dear XXXXX

This pack contains information about a research study being carried out by the University of East Anglia (UEA) in collaboration with (NAME OF HOSPITAL). You are being invited to take part in this study as you have recently been discharged from the (HOSPITAL NAME's Neonatal Unit). This information pack has been sent to all parents who match the inclusion criteria for this study (see below). This research is supported by (HOSPITAL NAME's Neonatal Unit) and this pack has been sent out to parents with the unit's permission.

The study is focused on the emotional experiences of birth mothers and fathers of premature babies of gestational age 29-36 weeks of birth weight higher than 1500g. You have been invited to take part because you are a parent of a premature baby identified by staff as matching these criteria.

This pack contains a detailed **Information Sheet** explaining the research as well as **two sets of questionnaires**. The study involves both mothers and fathers **completing a questionnaire pack each** and returning these in the stamped addressed envelope provided.

If you would like to take part, please complete the questionnaire pack within 3 weeks of receiving them and return them in the pre-paid envelope enclosed. If I have not received the questionnaire pack from you within 4 weeks of sending it to you, a reminder letter will be sent to you.

If you do not wish to take part it would be helpful if you could return the questionnaire pack blank. There is **no obligation** for you to take part in this study and a decision not to take part will not affect your care or your infant's care from the hospital.

**If you become upset or distressed whilst completing the questionnaires please stop completing them.** A list of useful contact numbers for places to gain support is included in the **Information Sheet**. Furthermore, if you have any questions please feel free to contact me on the number below.

If you would like to receive a summary of the results of this study please indicate this on the final page of the questionnaire pack.

Yours sincerely,

Josie Galpin  
Trainee Clinical Psychologist  
Researcher

**(07936 292168)**

SIGNATURE OF HOSPITAL REPRESENTATIVE

NAME OF UNIT MANAGER/REPRESENTATIVE  
TITLE



## Appendix I

**Participant Information Sheet – Second Recruitment Phase****Emotional experiences of parents of premature infants**

You are being invited to take part in a research study about the experience of parents who have premature babies. This information sheet will tell you about the study so that you are able to decide whether you would like to take part or not.

**What is the purpose of the study?**

The aim of the study is to find out more about the emotional experiences of mothers and fathers of babies who are born early (premature). The findings of this study will help to understand more about the experiences of parents and will help us to identify better ways of helping and supporting parents.

The study is being completed as part of the researcher's Doctorate in Clinical Psychology at the University of East Anglia (UEA) where the main researcher is studying as a trainee clinical psychologist.

**Why have I been invited?**

The study is focused on the experiences of birth mothers and fathers (18 years and over) of premature babies of gestational age 29-36 weeks of birth weight higher than 1500g. You have been invited because you are a parent of a premature baby identified by staff as matching these criteria.

**What does the study involve?**

The study involves filling out 6 short questionnaires. One will ask you for some basic information about yourself and your child. The other five will ask you about your levels of distress, mood, the support you have received, changes you may have noticed as a result of your experience and any repetitive thinking you have noticed related to your experience. The questionnaires take approximately 20-30 minutes to complete in total.

**What do I need to do to take part?**

Please complete the 6 questionnaires within the questionnaire pack and return the questionnaire pack in the pre-paid envelope enclosed.

**How will my answers be kept confidential?**

The information that you provide will be securely stored and kept anonymous and confidential. The questionnaires will have numbers on them, so you do not need to write your name on them.

### **What will happen to the results of the study?**

The study will be written up as part of the researcher's Doctorate in Clinical Psychology. If you would like, the researcher can send you a summary of the results.

### **Are there any risks involved?**

Some of the questions may raise concerns for some people. If concerns are raised for you as you complete the questionnaires, please stop completing the questionnaires. Some people may experience distress or have concerns after completing the questionnaires. Support or advice is available through contacting:

- Your GP
- Bliss is a charity that supports premature and sick babies and their families.
  - The family support helpline is 0500 618 140
  - The website is [www.bliss.org.uk](http://www.bliss.org.uk)
- Patient Advice and Liaison Services (PALS):
  - Norfolk & Norwich Hospital - 01603 289036
  - West Suffolk Hospital - 01284 712555
- Independent Complaints Advocacy Services (ICAS) - 0845 456 1084

If your responses on the questionnaires indicate high levels of distress or low mood, the researcher will write to you, recommending that you contact your GP.

### **What if I do not want to take part?**

You do not have to participate in this study. Your decision will not affect your care or your infants care in the hospital.

### **How do I find out more?**

You can contact the researcher via email or on the phone number below, or speak to NAMED REPRESENTATIVE OF HOSPITAL. Dr. Anna Adlam (supervisor for this research) is also available by phone (NUMBER) to discuss the study with you if you would like.

Thank you for considering taking part in this study.

Thank you for your time,

Josie Galpin (Trainee Clinical Psychologist)

## Appendix J

**Participant and Infant Information****Emotional experiences of parents of premature infants**

For the purpose of this study, it is helpful if you are able to provide us with particular information about you, your child and your family. If you do not wish to answer a question however, you do not have to.

1. What was your child's weight at birth?
2. At what gestational age was your child born?
3. How many weeks and days was your child hospitalised for? ((e.g., 1 week and 2 days)
4. Please list any health problems your child experienced when born and indicate which, if any, are still present. Please indicate which are still present by marking a [P] following the health problem.

5. What is your gender?

☐ Male

☐ Female

6. What is your age?

7. What is your marital status?

☐ Married/Civil Partner

☐ Partner

☐ Separated

☐ Divorced

☐ Widowed

☐ Single

8. Number of children (before birth of new born)?

9. What is your ethnic origin?

Please tick the appropriate box to indicate your ethnic group:

- ☐ Asian or Asian British –Bangladeshi
- ☐ Asian or Asian British – Indian
- ☐ Asian or Asian British – Pakistani
- ☐ Black or Black British – African
- ☐ Black or Black British – Caribbean
- ☐ Chinese
- ☐ Mixed – White and Asian
- ☐ Mixed – White and Black African
- ☐ Mixed – White and Black Caribbean
- ☐ Other Asian background
- ☐ Other Black background
- ☐ Other Ethnic background
- ☐ Other Mixed background
- ☐ Other White background
- ☐ White - British
- ☐ White - Irish
- ☐ Prefer not to say
- ☐ If any 'Other' category ticked, please specify if you

wish\_\_\_\_\_

10. Age at which left full time education

- ☐ Under 15
- ☐ 16
- ☐ 18
- ☐ 18 +
- ☐ Currently in education

11. Please indicate if you have previously been diagnosed with any of the following mental health difficulties. Tick all that apply.

- ☐ Depression
- ☐ Posttraumatic Stress Disorder (PTSD)
- ☐ Anxiety Disorder
- ☐ Other (please state) \_\_\_\_\_
- ☐ None

## Appendix K

### **Posttraumatic Growth Inventory**

Indicate for each of the statements below the degree to which this change occurred in your life *as a result of your experiences of having a premature baby on the Neonatal Ward*, using the following scale.

0= I **did not experience** this change.

1= I experienced this change to a **very small** degree.

2= I experienced this change to a **small** degree.

3= I experienced this change to a **moderate** degree.

4= I experienced this change to a **great** degree.

5= I experienced this change to a **very great** degree.

1. I changed my priorities about what is important in life.

0      1      2      3      4      5

2. I have a greater appreciation for the value of my own life.

0      1      2      3      4      5

3. I developed new interests.

0      1      2      3      4      5

4. I have a greater feeling of self-reliance.

0      1      2      3      4      5

5. I have a better understanding of spiritual matters.

0      1      2      3      4      5

0= I **did not experience** this change.

1= I experienced this change to a **very small** degree.

2= I experienced this change to a **small** degree.

3= I experienced this change to a **moderate** degree.

4= I experienced this change to a **great** degree.

5= I experienced this change to a **very great** degree.

6. I more clearly see that I can count on people in times of trouble.

0      1      2      3      4      5

7. I established a new path for my life.

0      1      2      3      4      5

8. I have a greater sense of closeness with others.

0      1      2      3      4      5

9. I am more willing to express my emotions.

0      1      2      3      4      5

10. I know better that I can handle difficulties.

0      1      2      3      4      5

11. I am able to do better things with my life.

0      1      2      3      4      5



0= I **did not experience** this change.

1= I experienced this change to a **very small** degree.

2= I experienced this change to a **small** degree.

3= I experienced this change to a **moderate** degree.

4= I experienced this change to a **great** degree.

5= I experienced this change to a **very great** degree.

12. I am better able to accept the way things work out.

0      1      2      3      4      5

13. I can better appreciate each day.

0      1      2      3      4      5

14. New opportunities are available which wouldn't have been otherwise.

0      1      2      3      4      5

15. I have more compassion for others.

0      1      2      3      4      5

16. I put more effort into my relationships.

0      1      2      3      4      5

17. I am more likely to try to change things which need changing.

0      1      2      3      4      5

18. I have a stronger religious faith.

0      1      2      3      4      5

0= I **did not experience** this change.

1= I experienced this change to a **very small** degree.

2= I experienced this change to a **small** degree.

3= I experienced this change to a **moderate** degree.

4= I experienced this change to a **great** degree.

5= I experienced this change to a **very great** degree.

19. I discovered that I'm stronger than I thought I was.

0      1      2      3      4      5

20. I learned a great deal about how wonderful people are.

0      1      2      3      4      5

21. I better accept needing others.

0      1      2      3      4      5

## Appendix L

### IMPACT OF EVENT SCALE- REVISED

**INSTRUCTIONS:** Below is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you **DURING THE PAST SEVEN DAYS** with respect to **your experience of having a premature baby on the Neonatal Ward**, which occurred between \_\_\_\_\_ and \_\_\_\_\_.

How much were you distressed or bothered by these difficulties?

	Not at all	A little bit	Moderately	Quite a bit	Extremely
Any reminder brought back feelings about it.					
I had trouble staying asleep.					
Other things kept making me think about it.					
I felt irritable and angry.					
I avoided letting myself get upset when I thought about it or was reminded of it.					
I thought about it when I didn't mean to.					
I felt as if it hadn't happened or wasn't real.					

	Not at all	A little bit	Moderately	Quite a bit	Extremely
I stayed away from reminders of it					
Pictures about it popped into my mind.					
I was jumpy and easily startled.					
I tried not to think about it.					
I was aware that I still had a lot of feelings about it, but I didn't deal with them.					
My feelings about it were kind of numb.					
I found myself acting or feeling like I was back at that time.					
I had trouble falling asleep.					
I had waves of strong feelings about it.					
I tried to remove it from my memory.					
I had trouble concentrating.					

	Not at all	A little bit	Moderately	Quite a bit	Extremely
Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart.					
I had dreams about it.					
I felt watchful and on-guard.					
I tried not to talk about it.					

**Event-Related Rumination Inventory**

After an experience like the one you have had (*having your premature baby hospitalised on the Neonatal Ward*) people sometimes, but not always, find themselves having thoughts about their experience even though they don't try to think about it. Indicate for the following items how often, if at all, you had the experiences described *during the weeks immediately after the birth of your child*.

	Not at all	Rarely	Sometimes	Often
I thought about the event when I did not mean to.				
Thoughts about the event came to mind and I could not stop thinking about them.				
Thoughts about the event distracted me or kept me from being able to concentrate.				
I could not keep images or thoughts about the event from entering my mind.				
Thoughts, memories, or images of the event came to mind even when I did not want them.				
Thoughts about the event caused me to relive my experience.				
Reminders of the event brought back thoughts about my experience.				
I found myself automatically thinking about what had happened.				
Other things kept leading me to think about my experience.				
I tried not to think about the event, but could not keep the thoughts from my mind.				

After an experience like the one you have had (*having your premature baby hospitalised on the Neonatal Intensive Care Unit (NICU)*) people sometimes, but not always, deliberately and intentionally spend time thinking about their experience. Indicate for the following items how often, if at all, you deliberately spent time thinking about the issues indicated during the *weeks immediately after the birth of your child*.

	Not at all	Rarely	Sometimes	Often
I thought about whether I could find meaning from my experience.				
I thought about whether changes in my life have come from dealing with my experience.				
I forced myself to think about my feelings about my experience.				
I thought about whether I have learned anything as a result of my experience.				
I thought about whether the experience has changed my beliefs about the world.				
I thought about what the experience might mean for my future.				
I thought about whether my relationships with others have changed following my experience.				
I forced myself to deal with my feelings about the event.				
I deliberately thought about how the event had affected me.				
I thought about the event and tried to understand what happened.				

## Appendix N

### **Crisis Support Scale (adapted)**

**(Joseph et al., 1992)**

We are interested in the help that you received from family and friends following your experience of having a premature baby on the Neonatal Intensive Care Unit (NICU). Please answer the questions that follow by circling the appropriate number from the scale below:

---

- 1 = Never  
2 = Very seldom  
3 = Seldom  
4 = sometimes  
5 = Often  
6 = Very often  
7 = Always
- 

1. Whenever you wanted to talk, how often was there someone willing to listen just after the birth?  
1                      2            3            4            5            6                      7
2. Whenever you want to talk, how often is there someone willing to listen at the present time?  
1                      2            3            4            5            6                      7
3. Did you have personal contact with other parents with a similar experience just after the birth?  
1                      2            3            4            5            6                      7
4. Do you have personal contact with other parents with a similar experience at the present time?  
1                      2            3            4            5            6                      7
5. Were you able to talk about your thoughts and feelings just after the birth?  
1                      2            3            4            5            6                      7
6. Are you able to talk about your thoughts and feelings at the present time?  
1                      2            3            4            5            6                      7
7. Were people sympathetic and supportive just after the birth?  
1                      2            3            4            5            6                      7
8. Are people sympathetic and supportive at the present time?  
1                      2            3            4            5            6                      7



9. Were people helpful in a practical sort of way just after the birth?  
1                      2                      3                      4                      5                      6                      7

10. Are people helpful in a practical sort of way at the present time?  
1                      2                      3                      4                      5                      6                      7

11. Did people you expected to be supportive make you feel worse at any time just after the birth?  
1                      2                      3                      4                      5                      6                      7

12. Do people you expect to be supportive make you feel worse at any time at the present time?  
1                      2                      3                      4                      5                      6                      7

13. Overall, were you satisfied with the support you received just after the birth?  
1                      2                      3                      4                      5                      6                      7

14. Overall, are you satisfied with the support you are receiving at the present time?  
1                      2                      3                      4                      5                      6                      7

## Appendix O

### Center for Epidemiologic Studies Depression Scale (CES-D)

Date: \_\_\_\_\_

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you've felt this way during the **past week**. Respond to all items.

Place a check mark (✓) in the appropriate column.  During the past week...	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	All of the time (5-7 days)
1. I was bothered by things that usually don't bother me.				
2. I did not feel like eating; my appetite was poor.				
3. I felt that I could not shake off the blues even with help from my family.				
4. I felt that I was just as good as other people.				
5. I had trouble keeping my mind on what I was doing.				
6. I felt depressed.				
7. I felt that everything I did was an effort.				
8. I felt hopeful about the future.				
9. I thought my life had been a failure.				
10. I felt fearful.				
11. My sleep was restless.				
12. I was happy.				
13. I talked less than usual.				
14. I felt lonely.				
15. People were unfriendly.				

16. I enjoyed life.				
17. I had crying spells.				
18. I felt sad.				
19. I felt that people disliked me.				
20. I could not "get going."				

## Appendix P

### Letter of ethical approval for first and second recruitment phases



## Health Research Authority

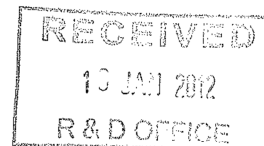
### NRES Committee East of England - Hertfordshire

Victoria House  
Capital Park  
Fulbourn  
Cambridge  
CB21 5XB

Telephone: 01223 597750  
Facsimile: 01223 597645

13 January 2012

Miss Josie Galpin  
University of East Anglia  
School of Medicine, Health Policy and Practice  
Norwich  
NR4 7TJ



Dear Miss Galpin

**Study title:** Posttraumatic stress and growth symptoms in parents  
of premature infants: the role of rumination and social  
support.  
**REC reference:** 11/EE/0383

Thank you for your letter of 15 December 2011, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Vice-Chair.

#### Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

#### Ethical review of research sites

##### NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

#### Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

*Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.*

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations

**It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).**

#### Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Covering Letter - email from Josie Galpin		25 November 2011
Covering Letter - listing revised documentation 2		
Evidence of insurance or indemnity - Zurich Municipal		23 August 2011
GP/Consultant Information Sheets	2	21 October 2011
Investigator CV - Miss Josie Galpin		30 August 2011
Investigator CV - Kiki Mastroyannopoulou		
Investigator CV - Dr Anna Adlam		
Letter from Sponsor - University of East Anglia		23 August 2011
Other: 'Covering letter of revised documentation'		25 November 2011
Other: Email from Josie Galpin - evidence of having gained advice about the marital status options in the questionnaire		25 November 2011
Participant Consent Form: Appendix B. Consent to share contact details	1	30 August 2011
Participant Consent Form	3	15 December 2011
Participant Information Sheet	3	15 December 2011
Protocol	1	30 August 2011
Questionnaire: Appendix F. Posttraumatic Growth Inventory	(validated)	
Questionnaire: Appendix I. Crisis Support Scale	(validated)	
Questionnaire: Centre for Epidemiologic Studies Depression Scale	(validated)	
Questionnaire: Participant and Infant Information	2	25 November 2011
Questionnaire: Event-Related Rumination Inventory	(validated)	
Questionnaire: Impact of Events Scale - revised (column headings are correct when JG prints out)		
REC application - IRAS Parts A&B 82912/246584/1/303		06 September 2011
Response to Request for Further Information - from Josie Galpin		30 November 2011
Response to Request for Further Information - from Miss Josie Galpin		15 December 2011
Summary/Synopsis - Postal Participation 1		09 September 2011
Summary/Synopsis - Non-postal participation 1		09 September 2011

### Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

### After ethical review

#### Reporting requirements

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

#### Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

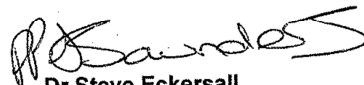
Further information is available at National Research Ethics Service website > After Review

11/EE/0383

Please quote this number on all correspondence

With the Committee's best wishes for the success of this project

Yours sincerely



Dr Steve Eckersall  
Chair

Email: april.saunders@eoe.nhs.uk

Enclosures: "After ethical review – guidance for researchers"



## Health Research Authority

### NRES Committee East of England - Hertfordshire

Victoria House  
Capital Park  
Fulbourn  
Cambridge  
CB21 5XB

Tel: 01223 597733  
Fax: 01223 597645

27 November 2012  
(Reissued to record there were no ethical issues)

Miss Josie Galpin  
University of East Anglia  
School of Medicine, Health Policy and Practice  
Norwich  
NR4 7TJ

Dear Miss Galpin

<b>Study title:</b>	<b>Posttraumatic stress and growth symptoms in parents of premature infants: the role of rumination and social support.</b>
<b>REC reference:</b>	<b>11/EE/0383</b>
<b>Amendment number:</b>	<b>Amendment #3 (Substantial)</b>
<b>Amendment date:</b>	<b>17 November 2012</b>
<b>Amendment summary:</b>	Change to the protocol. Previously parents were being recruited to the study whilst their child was still in the neonatal unit. To improve efficiency, reduce the burden on the unit and reduce intrusion for parents, this amendment proposes to send information about the study to parents immediately after their child's discharge from the unit (to ensure the status of the child's health is known). Return of a completed questionnaire will imply consent. Changes will be made to IRAS sections A6-2 (Recruitment), A13 (Summary of Design and Methodology), A18(Procedures), A26 and A30-1. The original aim was to recruit 43 pairs of patients. The amended calculation requires 37 pairs to be recruited.

The above amendment was reviewed on 28 November 2012 by the Sub-Committee in correspondence.

#### Ethical opinion

There were no ethical issues.

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

## Appendix Q

### Research & Development Approval

# Cambridge University Hospitals

NHS Foundation Trust

## Research and Development Department

R&D ref: A092355

3 February 2012

Tina Pollard  
Special Care Baby Unit  
Rosie Hospital  
Box 226  
Cambridge  
CB2 2QQ

Box 277  
Addenbrooke's Hospital  
Hills Road  
Cambridge  
CB2 0QQ

Direct Dial: 01223 348492 Ext 58492  
Switchboard: 01223 245151

E-mail: [nirvana.croft@addenbrookes.nhs.uk](mailto:nirvana.croft@addenbrookes.nhs.uk)  
[r&denquiries@addenbrookes.nhs.uk](mailto:r&denquiries@addenbrookes.nhs.uk)  
[www.addenbrookes.org.uk](http://www.addenbrookes.org.uk)

Dear Miss Pollard

**Re: 11/EE/0383 Posttraumatic stress and growth symptoms in parents of premature infants: the role of rumination and social support**

In accordance with the Department of Health's Research Governance Framework for Health and Social Care, all research projects taking place within the Trust must receive a favourable opinion from an ethics committee and approval from the Department of Research and Development (R&D) prior to commencement.

R&D have reviewed the documentation submitted for this project, and has undertaken a **site specific assessment** based on the information provided in the SSI form, and I am pleased to inform you that we have no objection to the research proceeding within Cambridge University Hospitals NHS Foundation Trust.

Sponsor: University of East Anglia

Funder: Own Account

End date: 28/09/2012

Protocol: version 1 dated 30 August 2011

The project must follow the agreed protocol and be conducted in accordance with all Trust Policies and Procedures especially those relating to research and data management.

You and your research team must ensure that you understand and comply with the requirements of the NHS Confidentiality Code of Practice and the Data Protection Act 1998 and are aware of your responsibilities in relation to the Human Tissue Act 2004, Good Clinical Practice, the NHS Research Governance Framework for Health and Social Care, Second Edition April 2005 and any further legislation released during the time of this study.

Members of the research team must have appropriate substantive or honorary contracts with the Trust prior to the study commencing. Any additional researchers who join the study at a later stage must also hold a suitable contract.

**If the project is a clinical trial under the European Union Clinical Trials Directive the following must also be complied with:**

V6 April 09

Innovation and excellence in health and care

Addenbrooke's Hospital | Rosie Hospital



- the EU Directive on Clinical Trials (Directive 2001/20/EC) and UK's implementation of the Directive: The Medicines for Human Use (Clinical Trials ) Regulations 2004;
- the EU Directive on Principles and Guidelines for Good Clinical Practice (EU Commission Directive 2005/28/EC); and UK's implementation of the Directive: The Medicines for Human Use (Clinical Trials) Amendment Regulations 2006;

#### **Amendments**

Please ensure that you submit a copy of any amendments made to this study to the R&D Department.

#### **Annual Report**

It is obligatory that an annual report is submitted by the Chief Investigator to the research ethics committee, and we ask that a copy is sent to the R&D Department. The yearly period commences from the date of receiving a favourable opinion from the ethics committee.

Please refer to our website [www.cuh.org.uk/research](http://www.cuh.org.uk/research) for all information relating to R&D including honorary contract forms, policies and procedures and data protection.

Should you require any further information please do not hesitate to contact us.

Yours sincerely



Louise Stockley  
Research governance Manager

Research & Development Approval – West Suffolk Hospital

**R&D Office**  
**West Suffolk Hospital**  
**Bury St. Edmunds**  
**IP33 2QZ**  
**Tel: 01284 712790**  
**Email: [R&D@wsh.nhs.uk](mailto:R&D@wsh.nhs.uk)**

*For **urgent** enquiries when the office is not staffed contact  
the Papworth R&D Department on Tel: 01480 364448.*  
13th February 2012

Miss Josie Galpin  
University of East Anglia  
School of Medicine  
Health Policy and Practice  
Norwich  
NR4 7TJ

Dear Miss Galpin

**Post-traumatic stress and growth symptoms in parents of premature infants: the role of rumination and social support**

**R&D Ref:** 2011WCH005

**MREC Ref:** 11/EE/0383

I am writing to confirm that the above project was reviewed by West Suffolk Hospital NHS Trust Research Operational Committee and has Trust Approval to proceed. Documents reviewed were those listed below:

- |                               |    |                                |
|-------------------------------|----|--------------------------------|
| – Protocol                    | V1 | 30 <sup>th</sup> August 2011   |
| – NHS REC Form & SSIF form    |    |                                |
| – Patient Information Sheet   | V3 | 15 <sup>th</sup> December 2011 |
| – Consent Form                | V3 | 15 <sup>th</sup> December 2011 |
| – Consent to pass information | V1 | 30 <sup>th</sup> August 2011   |
| – GP Letter                   | V2 | 21 <sup>st</sup> October 1011  |
| – Infant Information          | V2 | 25 <sup>th</sup> November 2011 |
| – Ethics Approval Letter      |    | 13 <sup>th</sup> January 2012  |

You are reminded that the study must follow the approved protocol and that any proposed amendments must be submitted for review via the West Suffolk Hospital R&D Office for subsequent trust approval.

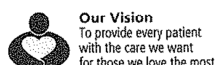
Approval is subject to compliance with the attached standard terms and conditions for research. You are required to comply in a timely manner with the project monitoring and auditing requirements of the Trust and may be asked to provide non-confidential information on the outputs and impact of the research.

We require that you **sign, date and return** the duplicate copy of this letter to the West Suffolk Hospital R&D Office to confirm your compliance with the Trust Policy and Procedures on Research Governance.

Yours sincerely

Dr Victoria Stoneman  
**Research & Development Manager**  
CC – Sharon Farthing – Neonatal Lead

## Research & Development Approval – Norfolk & Norwich University Hospital



Norfolk and Norwich University Hospitals **NHS**  
NHS Foundation Trust

Dr Paul Clarke  
Norfolk and Norwich University Hospitals  
NHS Foundation Trust  
Neonatal Intensive Care Unit  
Level 3 West Block  
Colney Lane  
Norwich  
NR4 7UY

Research & Development Office  
Level 3 East  
Norfolk & Norwich University Hospitals NHS Foundation Trust  
Colney Lane  
Norwich  
NR4 7UY

direct dial: 01603 287806  
direct fax: 01603 289800  
e-mail: [rdoffice@nnuh.nhs.uk](mailto:rdoffice@nnuh.nhs.uk)  
website: [www.nnuh.nhs.uk](http://www.nnuh.nhs.uk)

02 March 2012

Dear Dr Clarke,

**Re: R&D Reference Number:** 2011PAED18S (149-10-11)  
**Project Title:** Posttraumatic stress and growth symptoms in parents of premature infants: the role of rumination and social support

I am pleased to inform you that the above project, and amendment 1, has been given full NHS permission for research at Norfolk & Norwich University Hospitals NHS Foundation Trust.

This NHS permission for research has been granted on the basis described in the application form, protocol and supporting documentation. The agreed total local recruitment target for your study is 10-11 mother-father pairs.

The documents reviewed were:

Document		Version No	Date
Advertisement	Poster (Amendment 1)	1	17/01/2012
Questionnaire	Impact of Events Scale - revised		
Questionnaire	Event Related Rumination Inventory Measure	Validated	
Questionnaire	Participant and Infant Information	2	25/11/2011
Questionnaire	Centre for Epidemiologic Studies Depression Scale	Validated	
Questionnaire	Crisis Support Scale	Validated	
Questionnaire	Post traumatic Growth Inventory	Validated	
GP Letter		2	21/10/2011
Consent Form	Consent to share contact details	1	30/08/2011
Consent Form		3	15/12/2011
PIS		3	15/12/2011
Protocol		1	30/08/2011

I have enclosed two copies of the Standard Terms and Conditions of Approval. Please sign both copies returning one copy to the Research Governance office at the above address and keeping the other in your study file. Failure to return the standard terms and conditions may affect the conditions of approval.

**Please note, under the agreed Standard Terms and Conditions of Approval you must inform the R&D department of any proposed changes to this study and submit annual progress reports to the R&D department.**

Norfolk & Norwich University Hospitals NHS Foundation Trust

If you have any queries regarding this or any other project please contact Clare Collum, Research Facilitator, at the above address. Please note, the reference number for this study is **2011PAED18S (149-10-11)** and this should be quoted on all correspondence.

Yours sincerely

A handwritten signature in black ink, appearing to be 'K. Sethia', written over a horizontal line.

Professor Krishna Sethia  
**Medical Director**

Enc

Carbon Copy: (CI) Miss Josie Galpin

## Research & Development Approval – Ipswich Hospital

The Ipswich Hospital   
NHS Trust

Shelia Gauld  
**Ward Manager**  
Framlingham Neonatal Unit - N N U  
C364

**Research & Development Office**  
Post Bag Code C361  
The Ipswich Hospital  
Heath Road  
Ipswich  
Suffolk  
IP4 5PD

Tel: 01473 704343  
Fax: 01473 702206  
Email: research.office@ipswichhospital.nhs.uk

22 March 2012

Our Reference: 2011/086 FF

Dear Shelia

**R&D Ref: 2011/086**  
**CSP Ref: N/A**  
**UKCRN Ref: N/A**  
**Short Title: PTSS**  
**Title: Posttraumatic stress and growth in parents of premature of preterm infants**

The study has been reviewed at the Research Assessment Team meeting.

I am pleased to confirm that the above study has been given Trust Approval.

**Any researcher(s) whose substantive employer is not The Ipswich Hospital NHS Trust must have a Letter of Access or Honorary Research contract before coming on site to conduct their research in this project. Please note that you cannot take part in this study until you have this documentation. If a Letter of Access / Honorary Research Contract has not been issued please contact us immediately.**

Please find attached a copy of the following REC Approval letters which our approval relates to:  
REC Approval Letter dated 13 January 2012  
REC Approval Letter dated 07 February 2012

The Chief Investigator	Josie Galpin
The Local Collaborator	Sheila Gauld
Sponsor(s)	UEA
Funder(s)	N/A

	Approval Date	Ref/Signed by
The Project had ethical approval on	13 January 2012	East of England – Hertfordshire REC reference 11/EE/0383
The current approved protocol is v1.0	13 January 2012	East of England –

*All correspondence relating to Research must be addressed to the R&D Office  
(see address at top of letter)*

dated 30 August 2011

Hertfordshire  
REC reference 11/EE/0383

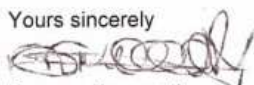
This approval is conditional on the following:

- a) You must ensure that you and your research team have read, understood and follow the **Research Management & Governance Manual - Standard Operating Procedures** (available on the Research & Development page on the Intranet or by request from the Research Office).
- b) **Please note that SOP004-007 apply to approved research.**
- c) The research is conducted in accordance with any project-specific agreement (attached to this letter if applicable). If the agreement identifies the Trust as a responsible party then that responsibility is delegated to yourself. You may wish to further delegate this to someone else but this must be recorded in your Site File in the 'Delegation Log'. In the event that you do not wish to accept responsibility then you must inform the Research Office as soon as possible. If the Trust cannot identify someone who is willing and able to accept a delegated responsibility then the Trust Approval will be suspended.
- d) **The appropriate headed paper must be used and it is the responsibility of the Principal Investigator to ensure that this is done.**

If you and/or your research team have not had Good Clinical Practice (GCP) training, please contact the Research Office who are arranging in-house training with an external trainer for research active staff.

May I take this opportunity to wish you well with this piece of research.

Yours sincerely



Frances Farnworth

cc (by email)

Chief Investigator

Josie Galpin

Sponsor's Representative

Sue Steel - UEA

*All correspondence relating to Research must be addressed to the R&D Office  
(see address at top of letter)*

## Appendix R

### Research & Development Approval – Second Phase Recruitment



Our Vision  
To provide every patient  
with the care we want  
for those we love the most

Norfolk and Norwich University Hospitals **NHS**  
NHS Foundation Trust

Dr Paul Clarke  
Norfolk and Norwich University Hospitals  
NHS Foundation Trust  
Neonatal Intensive Care Unit  
Level 3 West Block  
Colney Lane  
Norwich  
NR4 7UY

Research & Development Office  
Level 3 East  
Norfolk & Norwich University Hospitals NHS Foundation Trust  
Colney Lane  
Norwich  
NR4 7UY

direct dial: 01603 287806  
direct fax: 01603 289800  
e-mail: [rdoffice@nnuh.nhs.uk](mailto:rdoffice@nnuh.nhs.uk)  
website: [www.nnuh.nhs.uk](http://www.nnuh.nhs.uk)

07 December 2012

Dear Dr Clarke,

**Re: R&D Reference Number:** 2011PAED18S (149-10-11)  
**Project Title:** Posttraumatic stress and growth symptoms in parents of premature infants: the role of rumination and social support

Thank you for recent correspondence regarding amendment 03. It was noted that the amendment has already received a favourable opinion from the NRES Committee East of England - Hertfordshire.

Following review of the documentation I am pleased to inform you that there is no objection to this amendment.

The documents reviewed are as follows;

- Protocol, version 2, 30 August 2011
- Letter of invitation, version 2, 17 November 2012
- PIS, version 4, 17 November 2012

If you have any queries regarding this or any other project please contact Clare Collum, Research Facilitator, at the above address. Please note, the reference number for this study is **2011PAED18S (149-10-11)** and this should be quoted on all correspondence.

Yours sincerely

**Kath Andrews**  
**Research & Development Manager**

Carbon Copy: (CI) Miss Josie Galpin: [J.Galpin@uea.ac.uk](mailto:J.Galpin@uea.ac.uk)

R&D Office  
West Suffolk Hospital  
Bury St. Edmunds  
IP33 2QZ  
Tel: 01284 712790  
Email: [R&D@wsh.nhs.uk](mailto:R&D@wsh.nhs.uk)

For **urgent** enquiries when the office is not staffed contact  
the Papworth R&D Department on Tel: 01480 364448.  
18<sup>th</sup> December 2012

Miss Josie Galpin  
University of East Anglia  
School of Medicine  
Health Policy and Practice  
Norwich  
NR4 7TJ

Dear Miss Galpin

**Post-traumatic stress and growth symptoms in parents of premature infants: the role of rumination and social support**

R&D Ref: 2011WCH005

MREC Ref: 11/EE/0383

I am writing to confirm that the substantial amendment to the above project has been reviewed by West Suffolk Hospital R&D Department and agreed for implementation in the Trust by the Research Operational Committee. Documents reviewed were those listed below:

Amendment 3

Protocol	V2	17 <sup>th</sup> November 2012
Patient Information Sheet	V4	17 <sup>th</sup> November 2012
Invitation Letter - Covering Letter	V2	17 <sup>th</sup> November 2012
Ethics Approval Letter		27 <sup>th</sup> November 2012

Approval is subject to compliance with the standard terms and conditions notified at the time of Trust approval.

We require that you **sign, date and return** the duplicate copy of this letter to the West Suffolk Hospital R&D Office to confirm your compliance with the Trust Policy and Procedures on Research Governance.

Please do not hesitate to contact the R&D Office should you require any further information.

Yours sincerely

  
 Dr Victoria Stoneman  
Research & Development Manager

CC – Sharon Farthing – Neonatal Lead



## Appendix S

### Summary of Findings

Dear

Thank you for taking part in the Emotional Experiences of Parents of Preterm Infants study. As requested, here is a brief summary of the findings of this study.

The birth and hospitalisation of a premature baby can be traumatic for parents. One of the aims of this study was to explore the levels of posttraumatic stress symptoms (PTSS) in both mothers and fathers who have had this experience. The study was also interested in the potential positive psychological changes that people can experience when they have been through a distressing and traumatic event. This is called posttraumatic growth (PTG). Examples of PTG include, having a greater appreciation of life and feeling stronger as a person.

The study aimed to recruit mother-father pairs to complete 6 questionnaires each. Parents were recruited from 4 neonatal units within East Anglia. The study aimed to recruit a minimum of 37 mother-father pairs. Thirty mother-father pairs returned completed questionnaires. Twenty-three mothers also returned completed questionnaires. Therefore 53 mothers and 30 fathers took part.

The study wished to compare levels of PTSS and PTG between mothers and fathers and test a theoretical model of PTG. In this study, mothers reported significantly higher levels of trauma symptoms and growth symptoms than fathers.

Factors such as levels of rumination and social support were also explored within this study. Rumination means repetitive thinking. This study investigated two types of rumination, intrusive and deliberate. Intrusive refers to repetitive thinking that is not under our control. Deliberate rumination refers to deliberate attempts to try and make sense of what has happened. Intrusive rumination was related to trauma symptoms. Deliberate rumination was related to growth symptoms. This suggests that rumination may be an important process in the development of both trauma and growth symptoms. Mothers tended to experience higher levels of both intrusive and deliberate rumination than fathers.

Both mothers and fathers reported similar levels of social support, with parents reporting generally good levels of support. The less social support parents reported having, the more deliberate rumination they reported. It could be that lack of support triggered the need for parents to make sense of what happened. This needs to be tested by future research however.

For mothers, the more trauma symptoms they experienced, the more growth symptoms they experienced. This suggests that some level of distress is needed for growth to occur.

This was not found for fathers. This could be because trauma and growth symptoms were not high enough in fathers to find this relationship.

Future research needs to explore why there is this difference between mothers and fathers. The birth experience unique for mothers may partially explain this. It is important to find out what effect the experience of growth might have on people's quality of life and well-being also.

This study demonstrated that parents can experience both negative and positive experiences following the birth and hospitalisation of their premature infant. Clinicians need to be aware of this when working with parents. The findings support the need for comprehensive assessments of parents' needs and experiences whilst their child is on the NICU and following discharge home. Fathers are also under represented in paediatric research and therefore future studies need to consider how to increase the participation of fathers.

Thank you again for taking part and I hope that you find the results interesting.

Yours sincerely,

Josie Galpin

Trainee Clinical Psychologist

University of East Anglia (UEA)

## Appendix T

### Skewness and Kurtosis

*Skewness & kurtosis for all data*

Variable	Parent (M = Mother, F = Father)	Z (Skewness) <i>p</i> < .01	Z (Kurtosis) <i>P</i> < .01
PTGI	M	-.90	-1.14
	F	.52	-.34
IES-R	M	4.24*	2.92*
	F	2.75*	.15
ERRI - I	M	.40	-1.99
	F	1.78	-.84
ERRI - D	M	1.11	-1.17
	F	1.67	-.66
CSS	M	-2.15	.60
	F	-2.15	.78
CES-D	M	3.05*	.00
	F	5.74*	.78

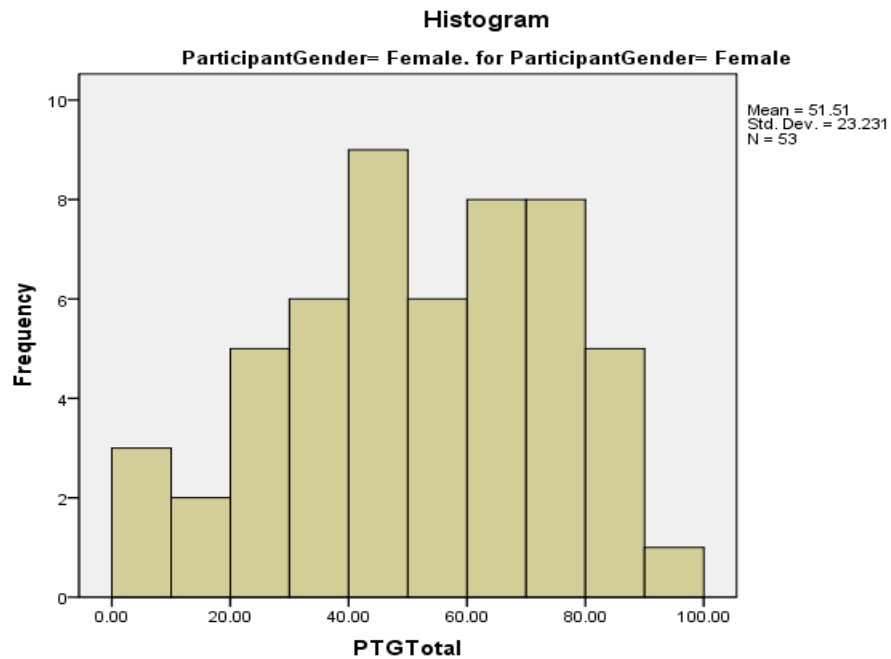
\*significant at  $p < .01$  indicating scores above 2.58 or -2.58

## Appendix U

### Histograms of Main Variables

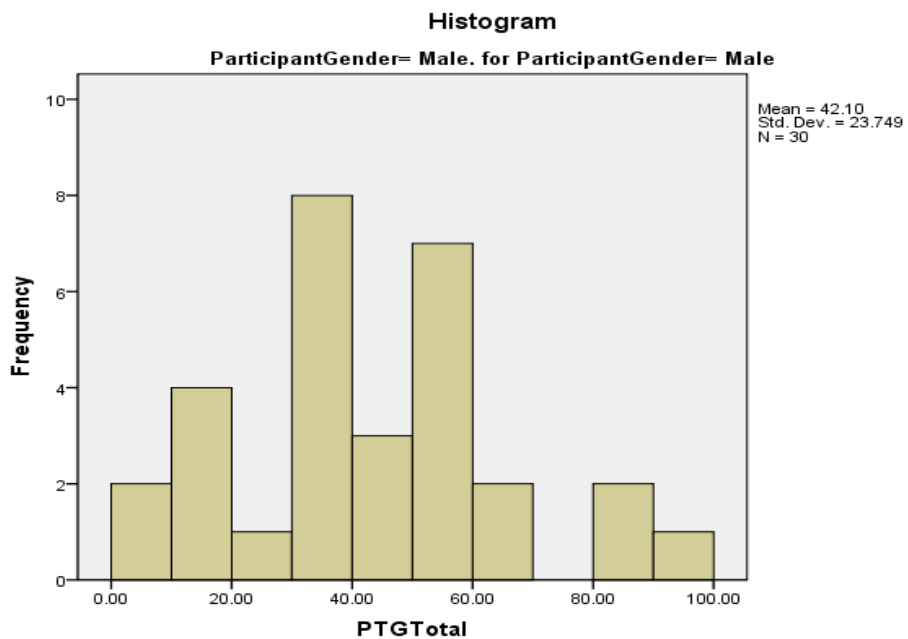
#### Histogram 1

##### Mothers - PTG Total



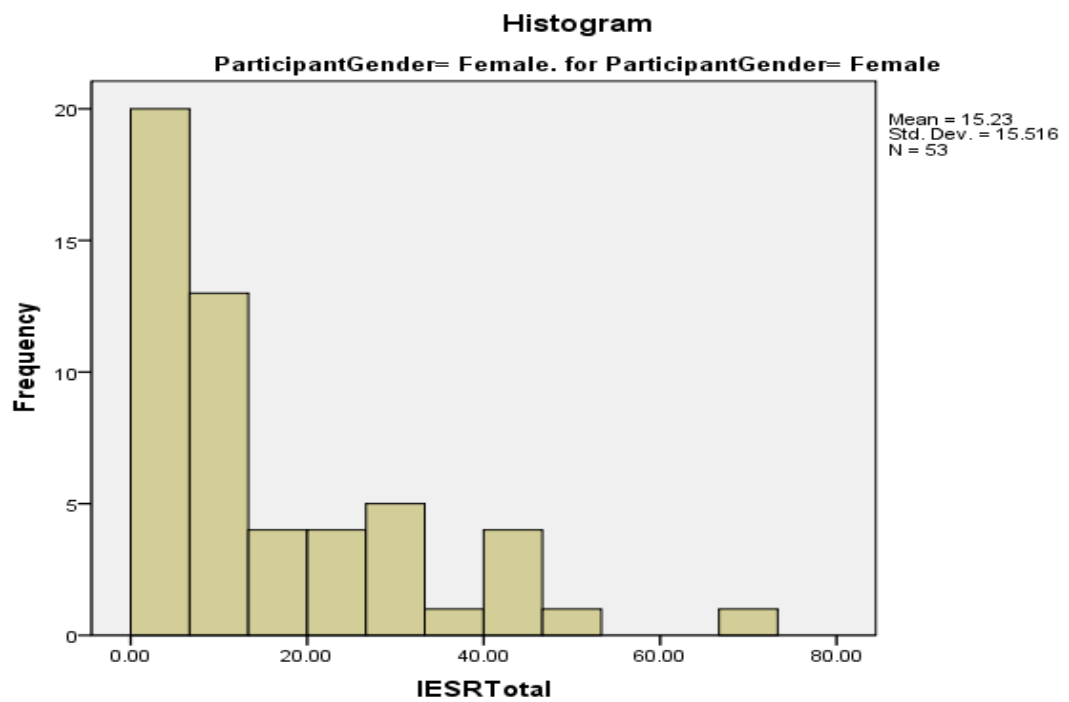
#### Histogram 2

##### Fathers – PTG Total



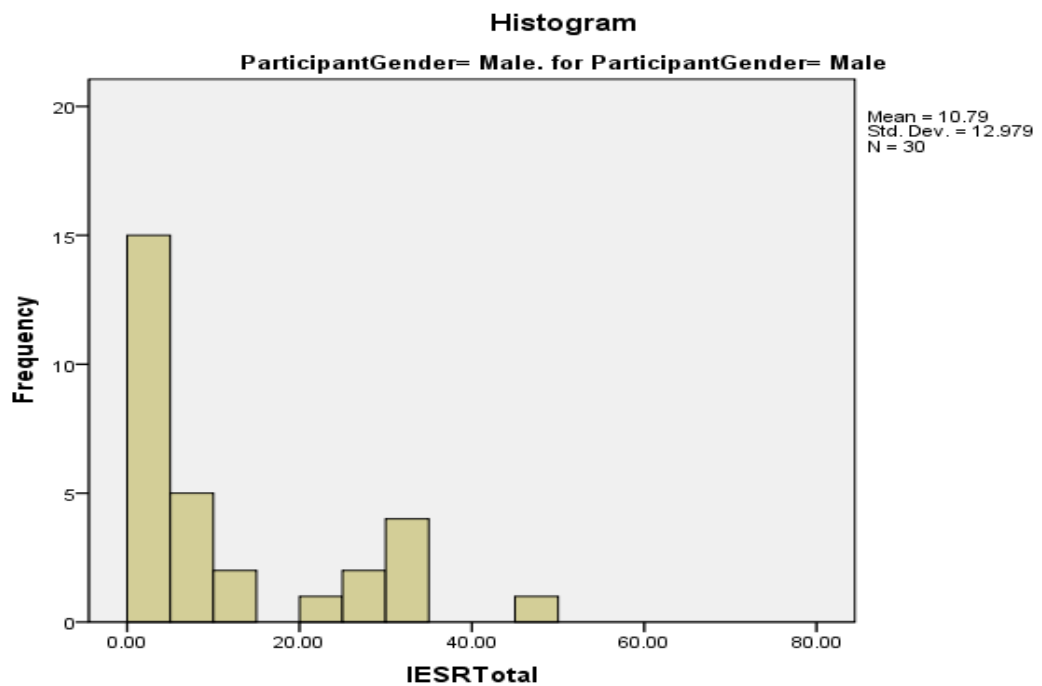
Histogram 3

Mothers - IES-R Total



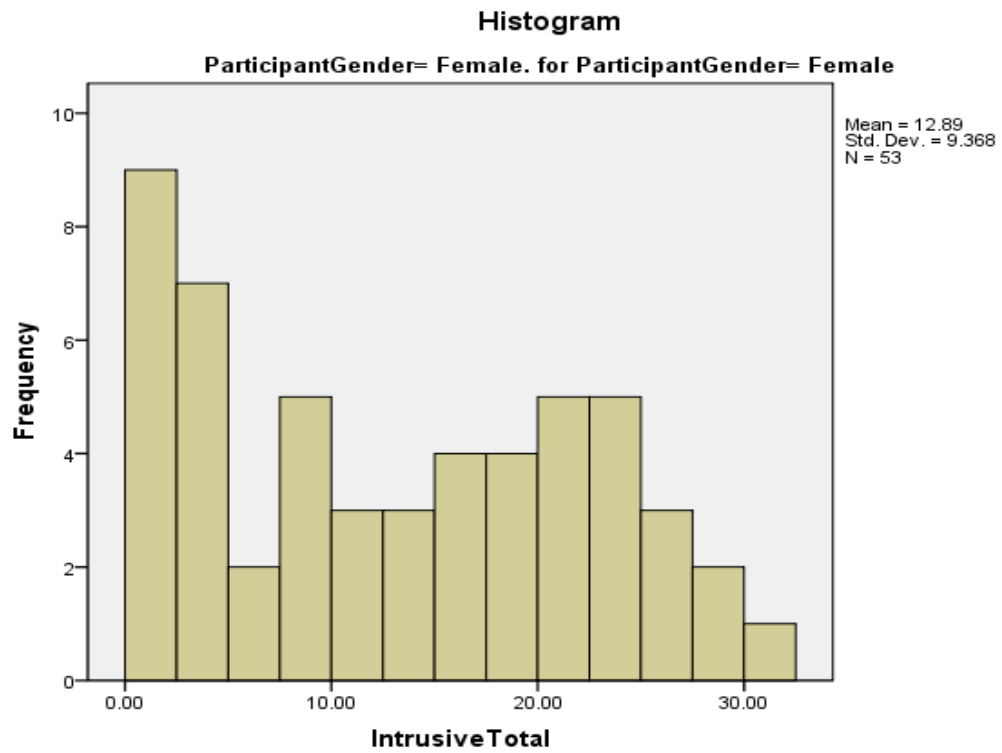
Histogram 4

Fathers – IES-R Total



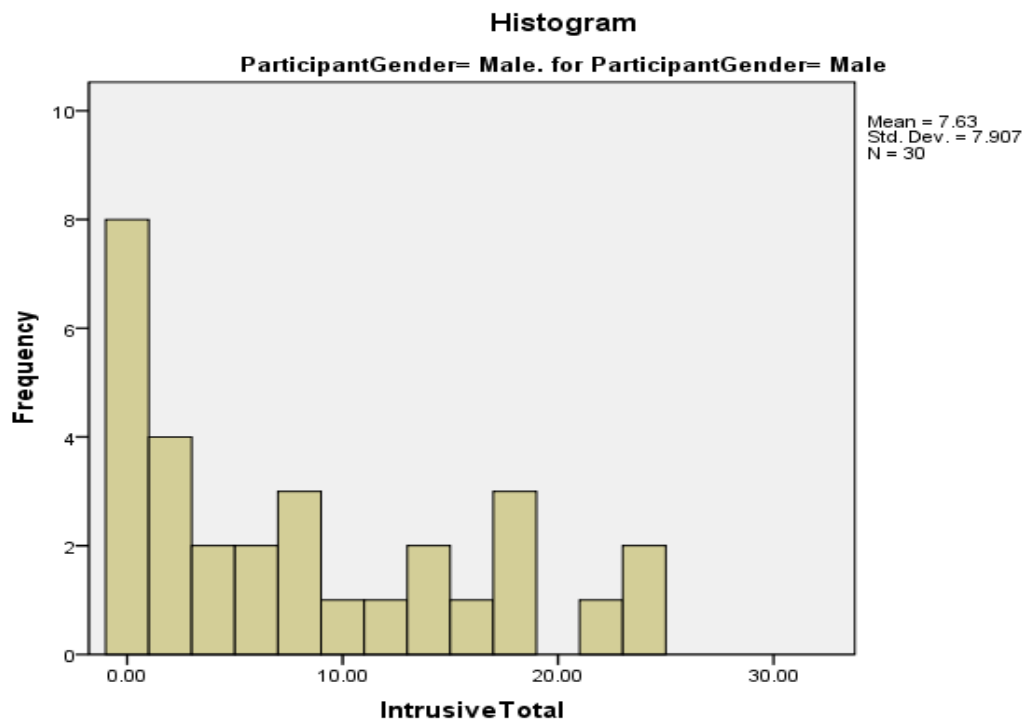
Histogram 5

Mothers – ERRI – Intrusive



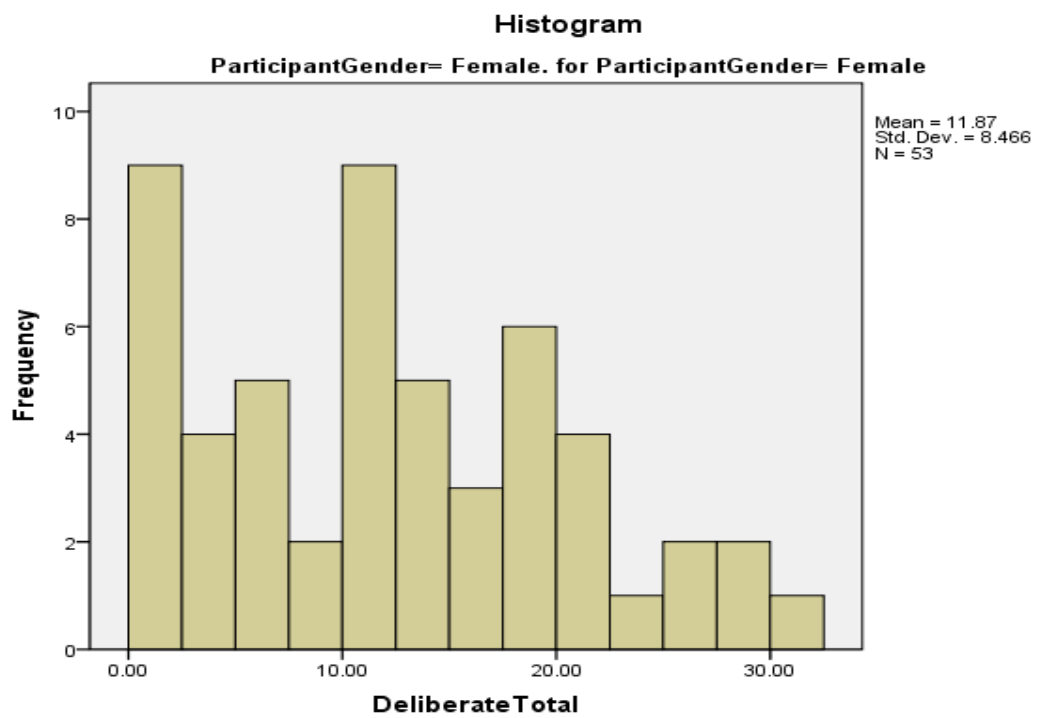
Histogram 6

Fathers – ERRI- Intrusive



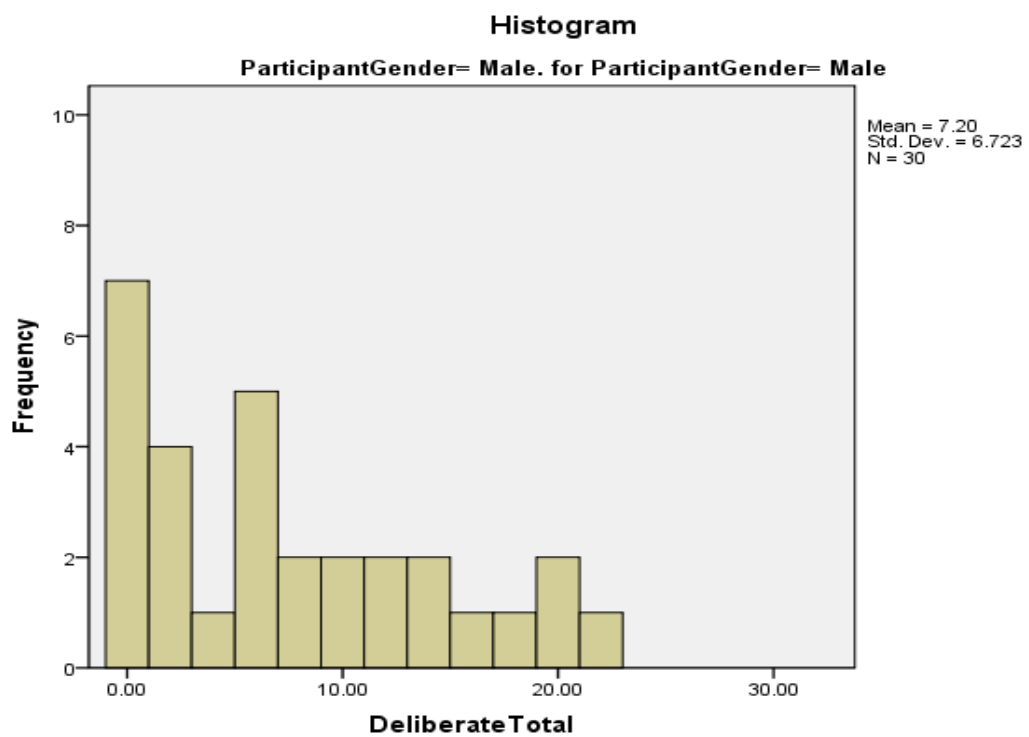
Histogram 7

Mothers – ERRI - Deliberate



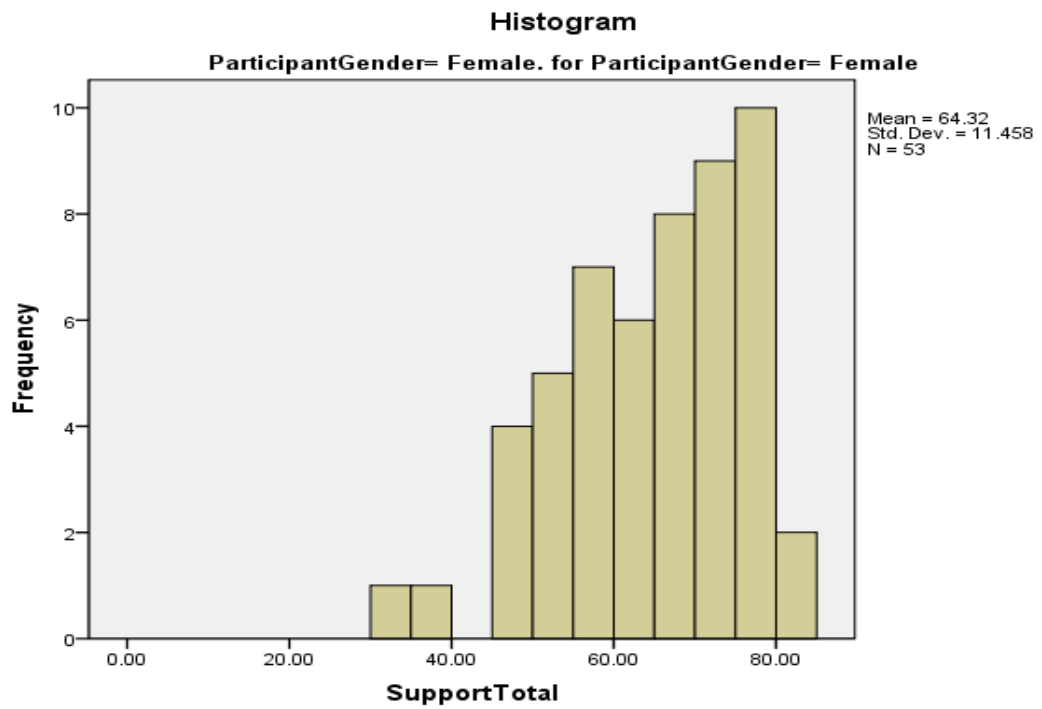
Histogram 8

Fathers – ERRI – Deliberate



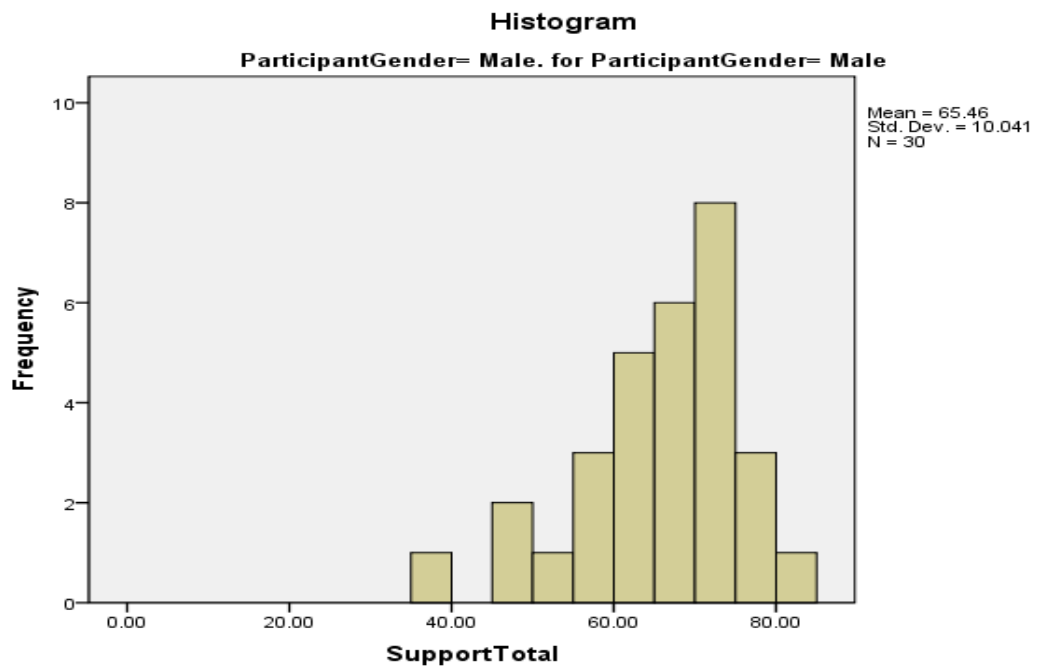
### Histogram 9

Mothers – CSS Total



### Histogram 10

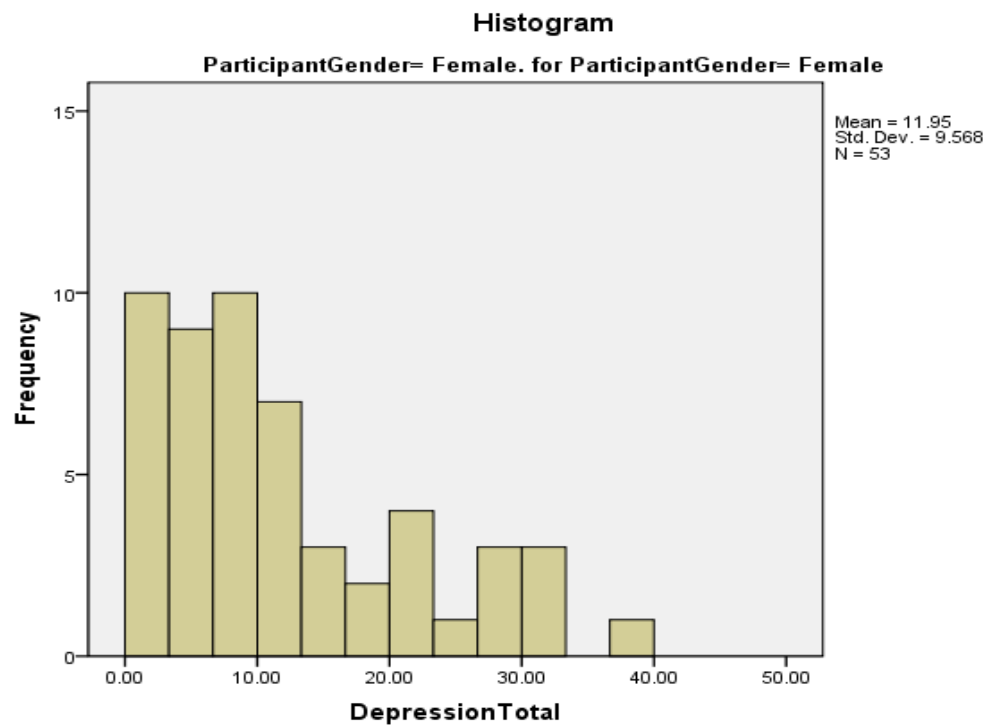
Fathers – CSS Total





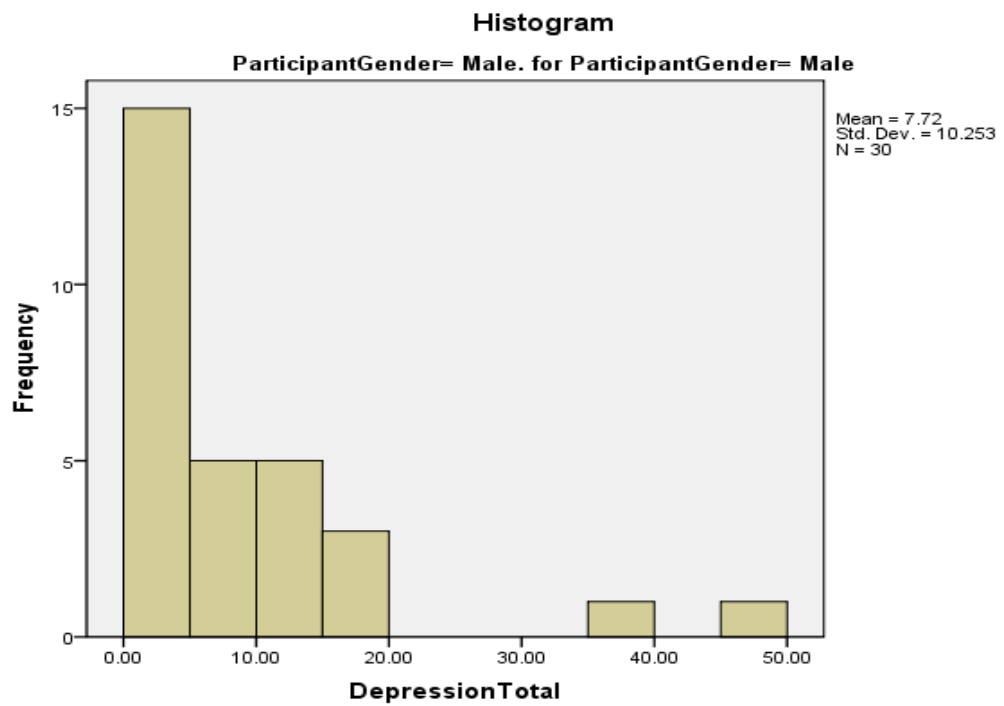
Histogram 11

Mothers – CES-D Total



Histogram 12

Fathers – CES-D Total

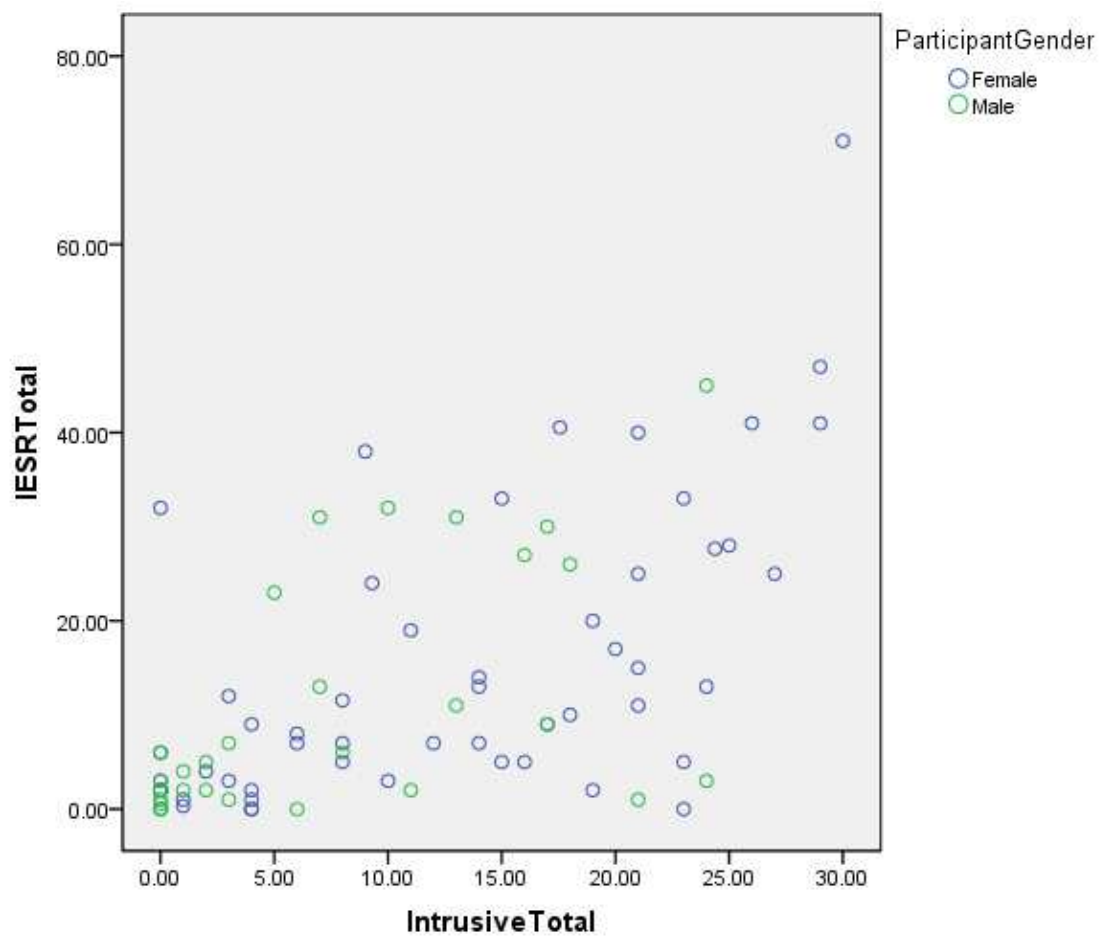


Appendix V

Scatterplots for All Data

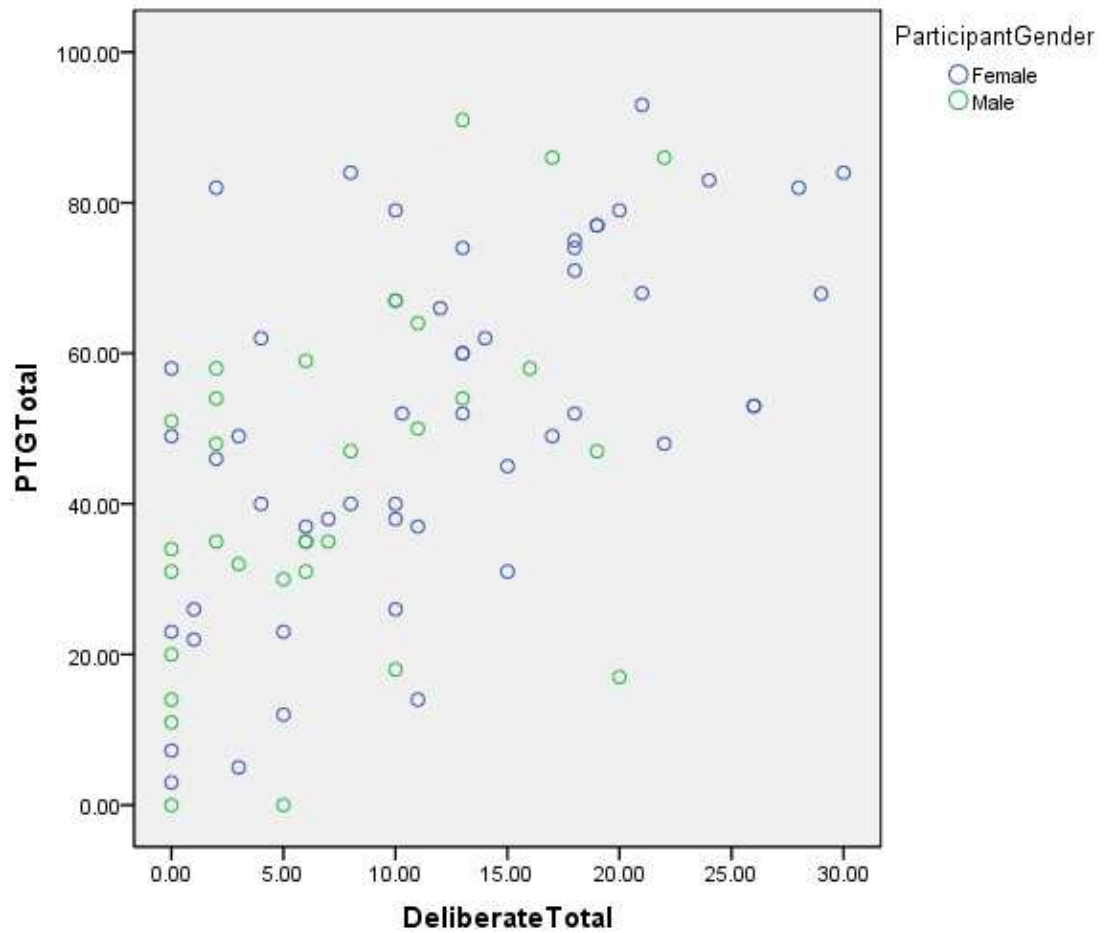
Graph1

Correlation between intrusive rumination and PTSS (Hypothesis 1a)



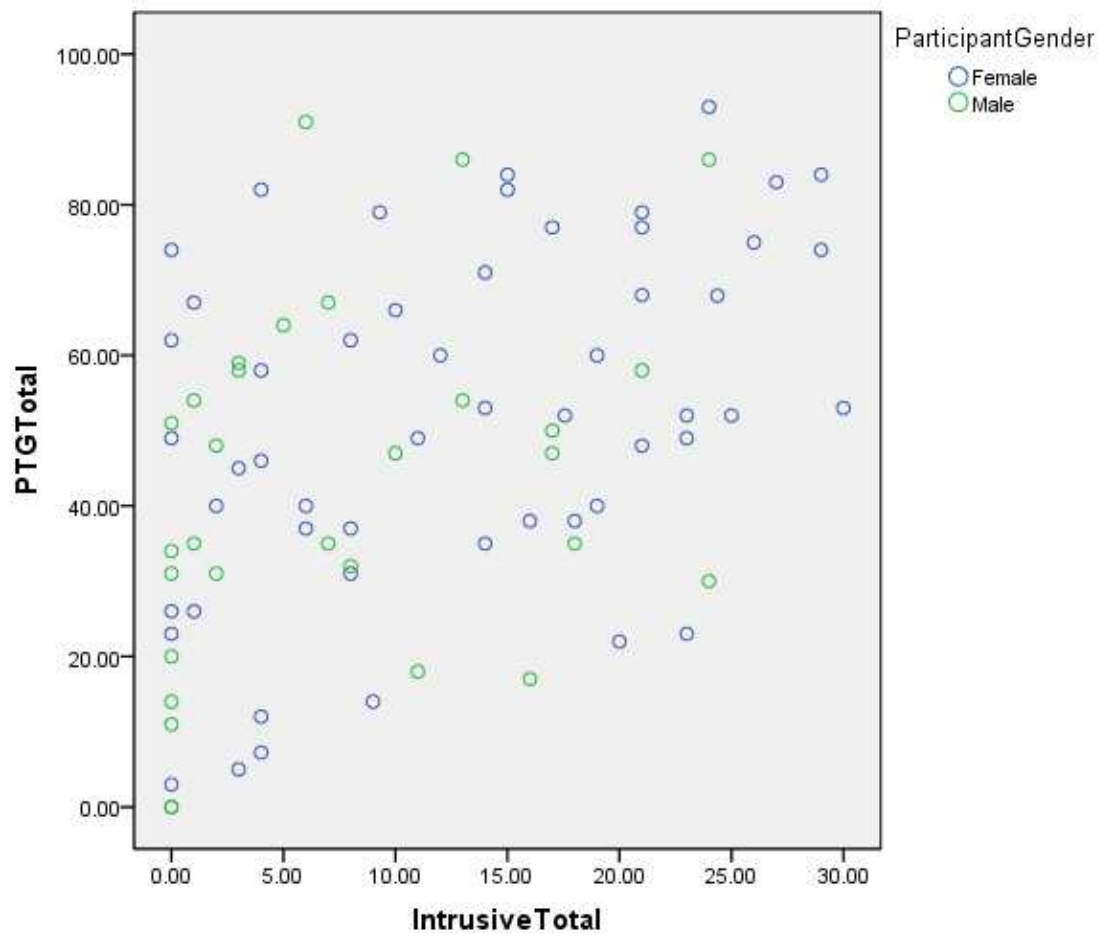
Graph 2

Correlation between deliberate rumination and PTG (Hypothesis 2b)



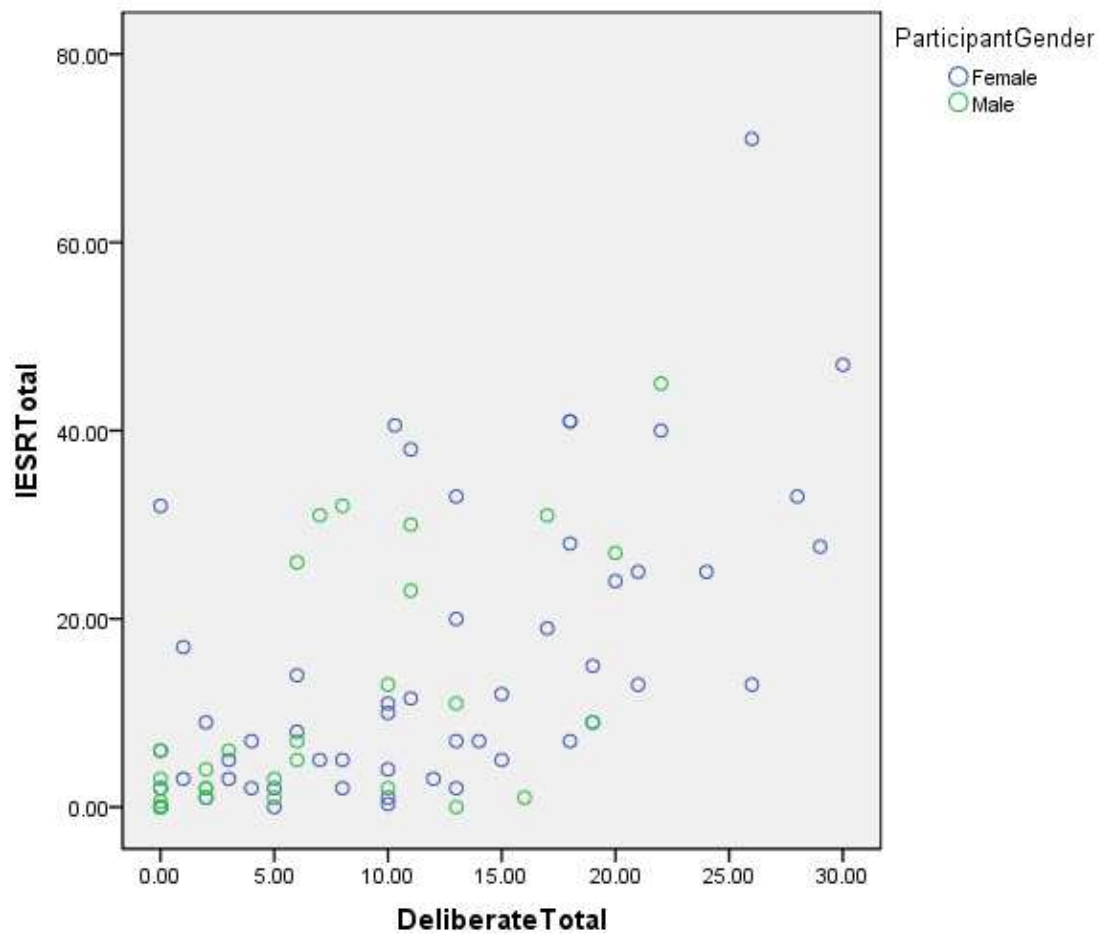
Graph 3

Correlation between intrusive rumination and PTG



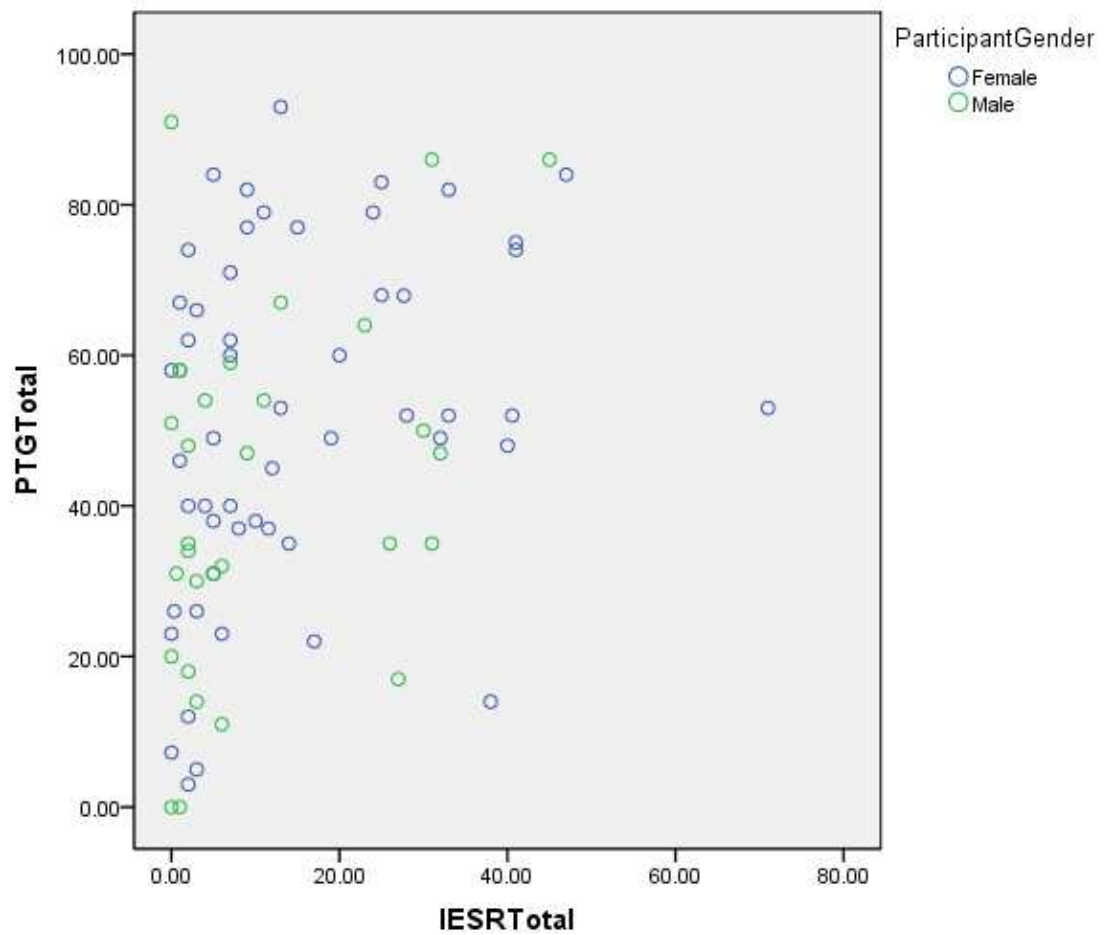
Graph 4

Correlation between deliberate rumination and PTSS



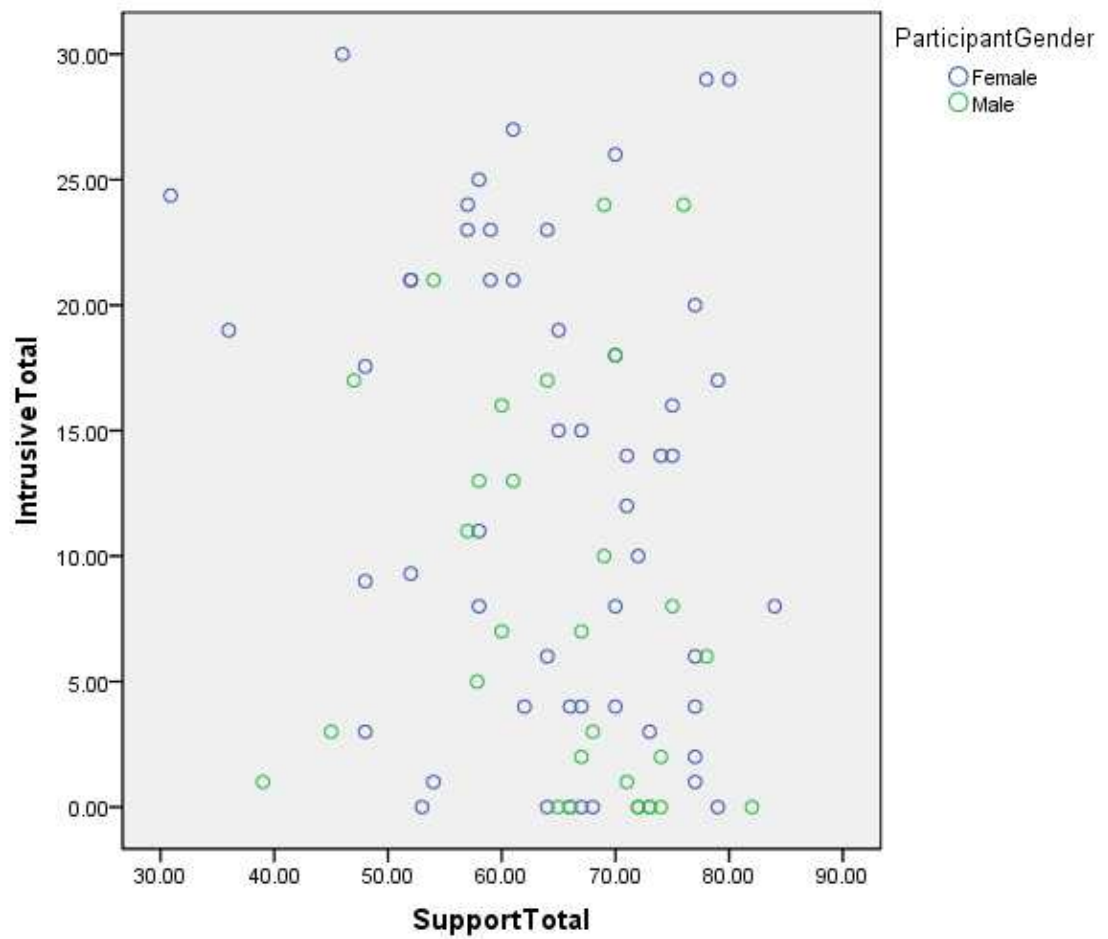
Graph 5

Correlation between PTG and PTSS (Hypothesis 5)



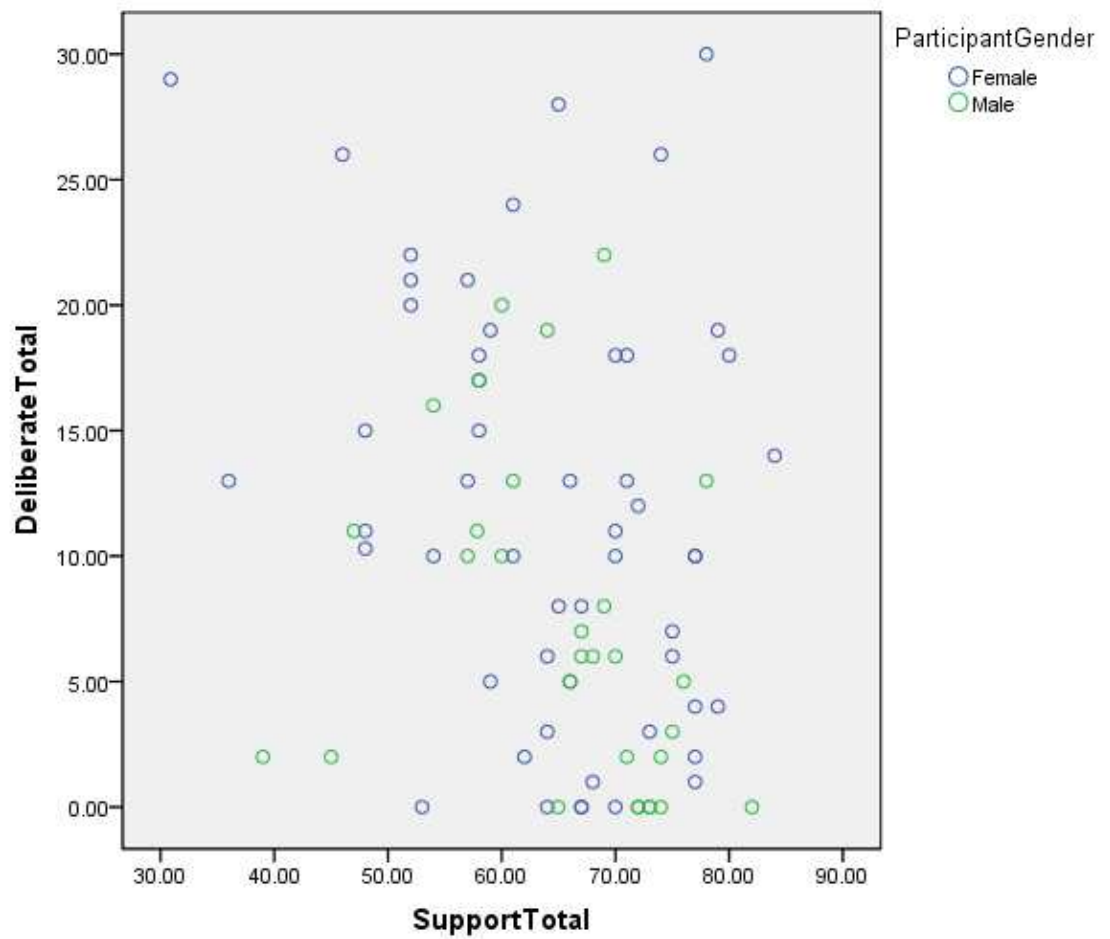
Graph 6

Correlation between intrusive rumination and perceived social support (Hypothesis 3a)



Graph 7

Correlation between deliberate rumination and social support (Hypothesis 3b)





# Appendix W

## Correlation Coefficients for Main Measures and Demographic Variables – Mothers' Data

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. PTG														
2. PTGo	.898**													
3. PTGnp	.926**	.743**												
4. PTGst	.854**	.784**	.748**											
5. PTGs	.613**	.391**	.611**	.347*										
6. PTGa	.818**	.665**	.727**	.611**	.481**									
7. IES-R	.381**	.190	.433**	.356**	.139	.436**								
8. IES-Ri	.409**	.231	.454**	.356**	.132	.476**	.952**							
9. IES-Ra	.242	.038	.308*	.246	.191	.242	.902**	.790**						
10. IES-Rh	.335*	.206	.384**	.297*	.000	.396**	.820**	.741**	.638**					
11. ERRI-I	.427**	.309*	.327*	.369**	.261	.562**	.626**	.641**	.518**	.479**				
12. ERRI-D	.603**	.499**	.600**	.491**	.417**	.519**	.639**	.647**	.585**	.438**	.611**			
13. CES-D	.299*	.171	.306*	.121	.184	.396**	.612**	.581**	.543**	.610**	.413**	.414**		
14. CSS-T	.045	.102	.019	-.019	.091	.071	-.318*	-.263	-.449**	-.274*	-.208	-.250	-.364**	
15. Gest	-.156	-.105	-.119	-.067	-.141	-.343	-.337*	-.360**	-.227	-.296*	-.546**	-.310*	-.285*	-.176
16. BW	-.157	-.177	-.093	-.122	-.033	-.274*	-.167	-.221	-.039	-.157	-.489**	-.235	-.144	-.218
17. DH	.130	.121	.073	.023	.102	-.322*	.284*	.313*	.147	.279*	.558**	.323*	.245	.080
18. HP	-.059	-.025	-.101	-.199	-.133	-.151	.006	.042	-.131	.021	.200	.078	.083	-.084
19. Age	-.516**	-.561**	-.399**	-.575**	-.105	-.331*	-.185	-.189	-.093	-.183	-.085	-.232	-.146	.043
20. MS	.071	.032	.188	-.054	-.093	.102	.058	.049	-.043	.196	-.118	.004	.017	.120
21. NPC	-.118	-.191	-.043	-.234	.111	-.040	.000	.071	-.066	.042	-.006	-.084	.059	-.135
22. Eth	.037	-.047	.068	.212	-.093	.034	.213	.254	.157	.148	-.032	.090	-.030	-.098
23. ALE	-.092	-.048	-.112	-.043	-.007	-.139	.004	-.066	.200	-.194	.056	.095	-.126	-.141
24. MH	.031	.080	.000	.037	-.212	.044	.015	-.037	-.017	.077	-.083	-.149	.075	-.031
25. TT	.054	.036	.120	-.083	.037	.133	-.079	-.048	-.126	-.051	-.169	-.097	.133	.043

Note. Gest = Gestation; BW = Birthweight; DH = Days Hospitalised; HP = Number of Health Problems; MS = Marital Status; NPC = Number of Previous Children; Eth = Ethnicity; ALE = Age Left Education; MH = Previous Mental Health Diagnoses; TT = Twins or Triplets \*  $p < .05$ . \*\*  $p < .01$ . two-tailed

*Correlation Coefficients for Main Measures and Demographic Variables – Fathers’ Data*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. PTG														
2. PTGo	.869**													
3. PTGnp	.775**	.576**												
4. PTGst	.918**	.743**	.638**											
5. PTGs	.541**	.460**	.273	.566**										
6. PTGa	.786**	.519**	.711**	.752**	.372*									
7. IES-R	.285	.152	.313*	.245	.357*	.404*								
8. IES-Ri	.317*	.179	.321*	.275	.359*	.421*	.932**							
9. IES-Ra	.248	.130	.268	.190	.316*	.332*	.889**	.739**						
10. IES-Rh	.270	.180	.268	.264	.375*	.323*	.867**	.740**	.832**					
11. ERRI-I	.396*	.279	.268	.453**	.502**	.415*	.605**	.635**	.500**	.422*				
12. ERRI-D	.515**	.373*	.408*	.519**	.664**	.481**	.606**	.628**	.524**	.511**	.827**			
13. CES-D	.395*	.354	.297	.389*	.329	.383*	.486**	.351	.476**	.584**	.329	.546**		
14. CSS-T	-.249	-.223	-.162	-.231	-.408*	.065	-.287	-.281	-.276	-.317	-.316	-.470**	-.323	
15. Gest	-.154	-.149	-.041	-.163	.018	-.241	-.422*	-.466**	-.287	-.177	-.356	-.210	-.191	-.118
16. BW	-.013	-.033	.122	-.011	-.030	.003	-.188	-.246	-.040	.007	-.224	-.059	-.040	-.056
17. DH	.120	.168	.056	.135	.039	.198	.341	.389*	.238	.126	.409*	.300	.247	-.005
18. HP	-.142	-.065	.076	-.231	-.129	-.215	.067	.038	.067	.054	.215	.185	.110	-.236
19. Age	-.279	-.165	-.218	-.290	-.281	-.244	-.092	-.043	-.057	-.188	-.164	-.148	-.162	-.077
20. MS	-.141	-.361	-.050	.023	-.062	.041	-.164	-.221	-.052	-.128	-.018	-.106	-.156	-.159
21. NPC	.272	-.278	-.115	.236	.221	.033	-.022	.085	-.052	.001	.130	.253	.257	-.365*
22. Eth	.260	.095	.306	.341	.346	.280	.349	.343	.372*	.394*	.263	.290	.199	-.322
23. ALE	-.258	-.083	-.338	-.281	.102	-.289	-.178	-.157	-.189	-.029	-.124	.011	.036	.128
24. MH	-.236	-.260	-.275	-.284	-.018	-.244	.378*	.348	.313	.330	.024	-.103	-.110	-.212
25. TT	.131	.155	.108	.039	-.210	.178	-.085	-.156	-.137	.056	-.156	-.187	.054	.224

*Note.* Gest = Gestation; BW = Birthweight; DH = Days Hospitalised; HP = Number of Health Problems; MS = Marital Status; NPC = Number of Previous Children; Eth = Ethnicity; ALE = Age Left Education; MH = Previous Mental Health Diagnoses; TT = Twins or Triplets \*  $p < .05$ . \*\*  $p < .01$ . two-tailed

## Appendix X

### *Correlation coefficients for PTSS and PTG subscales for research question 1- Mothers' Data*

	1	2	3	4	5	6	7	8	9	10	11
1. PTG											
2. PTGo	.898**										
3. PTGnp	.926**	.743**									
4. PTGst	.854**	.784**	.748**								
5. PTGs	.613**	.391**	.611**	.347**							
6. PTGa	.818**	.665**	.727**	.611**	.481**						
7. IES-R	.381**	.190	.433**	.356**	.139	.436**					
8. IES-Ri	.409**	.231*	.454**	.356**	.132	.476**	.952**				
9. IES-Ra	.242**	.038	.308*	.246*	.191	.242*	.902**	.790**			
10. IES-Rh	.335**	.206	.384**	.297*	.000	.396**	.820**	.741**	.638**		
11. Rint	.427**	.309*	.327**	.369**	.261*	.562**	.626**	.641**	.518**	.479**	
12. Rdel	.603**	.499**	.600**	.491**	.417**	.519**	.639**	.647**	.585**	.438**	.611**

*Note.* PTG = PTGI total; PTGo = PTGI appreciation of life; PTGnp = PTGI new possibilities; PTGst = PTGI strength; PTGs = PTGI spiritual; PTGa = appreciation of life; IES-R = IES-R total; IES-Ri = IES-R intrusions; IES-Ra = IES-R avoidance; IES-Rh = IES-R hyperarousal; Rint = intrusive rumination; Rdel = deliberate rumination.

\* $p < .05$ . \*\* $p < .01$ . one-tailed

*Correlation coefficients for PTSS and PTG subscales for research question 1- Fathers' Data*

	1	2	3	4	5	6	7	8	9	10	11
1. PTG											
2. PTGo	.869**										
3. PTGnp	.775**	.576**									
4. PTGst	.918**	.743**	.638**								
5. PTGs	.541**	.460**	.273	.566**							
6. PTGa	.786**	.519**	.711**	.752**	.372*						
7. IES-R	.285	.152	.313*	.245	.357*	.404*					
8. IES-Ri	.317*	.179	.321*	.275	.359*	.421*	.932**				
9. IES-Ra	.248	.130	.268	.190	.316*	.332*	.889**	.739**			
10. IES-Rh	.270	.180	.268	.264	.375*	.323*	.867**	.740**	.832**		
11. Rint	.396*	.279	.268	.453**	.502**	.415*	.605**	.635**	.500**	.422*	
12. Rdel	.515**	.373*	.408*	.519**	.664**	.481**	.606**	.628**	.524**	.511**	.827**

*Note.* PTG = PTGI total; PTGo = PTGI appreciation of life; PTGnp = PTGI new possibilities; PTGst = PTGI strength; PTGs = PTGI spiritual; PTGa = appreciation of life; IES-R = IES-R total; IES-Ri = IES-R intrusions; IES-Ra = IES-R avoidance; IES-Rh = IES-R hyperarousal; Rint = intrusive rumination; Rdel = deliberate rumination.

\* $p < .05$ . \*\* $p < .01$ . one-tailed

## Appendix Y

### *Correlation coefficients for PTSS and PTG subscales for research question 5a- Mothers' Data*

	1	2	3	4	5	6	7	8	9
1. PTG									
2. PTGo	.898**								
3. PTGnp	.926**	.743**							
4. PTGst	.854**	.784**	.748**						
5. PTGs	.613**	.391**	.611**	.347*					
6. PTGa	.818**	.665**	.727**	.611**	.481**				
7. IES-R	.381**	.190	.433**	.356**	.139	.436**			
8. IES-Ri	.409**	.231	.454**	.356**	.132	.476**	.952**		
9. IES-Ra	.242	.038	.308*	.246	.191	.242	.902**	.790**	
10. IES-Rh	.335*	.206	.384**	.297*	.000	.396**	.820**	.741**	.638**

*Note.* PTG = PTGI total; PTGo = PTGI appreciation of life; PTGnp = PTGI new possibilities; PTGst = PTGI strength; PTGs = PTGI spiritual; PTGa = appreciation of life; IES-R = IES-R total; IES-Ri = IES-R intrusions; IES-Ra = IES-R avoidance; IES-Rh = IES-R hyperarousal;

\* $p < .05$ . \*\* $p < .01$ . two-tailed.

*Correlation coefficients for PTSS and PTG subscales for research question 5a- Fathers' Data*

	1	2	3	4	5	6	7	8	9
1. PTG									
2. PTGo	.869**								
3. PTGnp	.775**	.576**							
4. PTGst	.918**	.743**	.638**						
5. PTGs	.541**	.460*	.273	.556**					
6. PTGa	.786**	.519**	.711**	.752**	.372*				
7. IES-R	.285	.152	.313	.245	.357	.404*			
8. IES-Ri	.317	.179	.321	.275	.359	.421*	.932**		
9. IES-Ra	.248	.130	.268	.190	.316	.332	.889**	.739**	
10. IES-Rh	.270	.180	.268	.264	.375*	.323	.867**	.740**	.832**

*Note.* PTG = PTGI total; PTGo = PTGI appreciation of life; PTGnp = PTGI new possibilities; PTGst = PTGI strength; PTGs = PTGI spiritual; PTGa = appreciation of life; IES-R = IES-R total; IES-Ri = IES-R intrusions; IES-Ra = IES-R avoidance; IES-Rh = IES-R hyperarousal; Rint = intrusive rumination; Rdel = deliberate rumination.

\* $p < .05$ . \*\* $p < .01$ . two-tailed

## Appendix Z

### *Correlation Coefficients for Social Support and Rumination Type for Question 3- Mothers' Data*

	1.	2.
1. CSS Total		
2. ERRI – Intrusive	-.208	
3. ERRI- Deliberate	-.250	.611**

*Note.* CSS Total = Crisis Support Scale total; ERRI-Intrusive = Event related rumination inventory – intrusive; ERRI-Deliberate = Event related rumination inventory – deliberate.

\*\* $p < .05$  two-tailed

### *Correlation Coefficients for Social Support and Rumination Type for Question 3-Fathers' Data*

	1.	2.
1. CSS Total		
2. ERRI – Intrusive	-.316	
3. ERRI- Deliberate	-.470**	.827**

*Note.* CSS Total = Crisis Support Scale total; ERRI-Intrusive = Event related rumination inventory – intrusive; ERRI-Deliberate = Event related rumination inventory – deliberate.

\*\* $p < .05$  two-tailed





